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NAVY AIR TO AIR MISSILE STUDY
FIRE CONTROL REQUIREMENTS (

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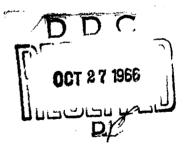
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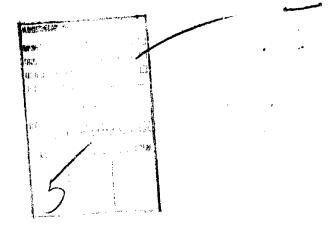
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CONTENTS

ABSTR	ACI		•	٠	•	•	•	•	٠	•	٠	٠	•	٠	•	٠	•	٠	•	•	٠	٠	٠	•	•	٠	٠	•	٠	٠	•	1
PROBI	EM	STA	¥TU	IS	•	•				•			•	•		7		•	•	•	•	•	•	•		•	•			•	•	i
AUTHO	RIZ	AT)	[ON	ſ				•			•					•			•			•				•				•	•	1
INTRO	DUC	TI	NC		•		•		•			•			•					•	•				•		•	•		•		1
OBJEC	TIV	ES			•			•	•				,						•		•	•	•						•	•	•	1
GENER	AL	SU	MMA	RY	•		•					•	•				•		•		•		•	•				•	•	•	٠	2
DETAI	ıs	of	SI	MU	ΠA	TI	ON	ī	•			•	•			•		•		•	•	•		•			•	•	•			4
	MET	HOI	D		•					•	•			,							•	•	•	•			•	•	•	•		4
	MOC	K-U	JP	•					•		•	•	•		•		•	•	•		•		•		•	•	•	•	•			5
	DIS	PL	AY		•			•	•	٠			•	•	•	•					•		•	•	•			•	•			6
	SWI	TC1	HIN	IG	FR	(MO	1 8	ΕA	R	H	T	. כ	rr/	CF	C	•	•	•	•	•	•	•					•		•			7
	DAT	:A :	PRE	SE	lNI	ľA:	'IC	N	•		•	•		•	•	•		•	•	•	•	•		•	•	•		•	•	•		7
CRITE	RLA	F	OR	SU	ICC	æ	S	•	•		•	•	•				•	•	•	•	•							•	•	•	:	12
FIRE	COI	TR	ΟĽ	IN	VE	SI	'IG	ΙA	'IC	NC									•		•	•		•	•		•	•	•			12
	NOF	LMA.	L A	LI.I	:AC	Ж	MC	DE	Ē		•	•		•			•		•						•	•	•	•	•	•	:	13
	HOJ	Γ A!	PTA	rck	M	1OI	Œ				•				•				•						•	•	•	•		•	:	17
	AOJ	ΓA!	PT#	CK	[]	10I	Œ		•	•	•		•	•		•		•	•	•	•	•	•	•	•	٠	•	٠		•		19
	AWS	3 M	ODE	2	•						•			•	•			•	٠		٠		•	•	•	•	٠	•	•	٠	2	22
CONCI	us:	[ON	S A	MI) F	ŒC	2O1	M	eni)A!	CI(NC	3	٠						•			•						•	•	â	24
ACKING	MI	EDG:	EME	eni	:S	•	•		•	•		•	•	•		•		•		•		•		•	•	•	•	•			:	28
REFEF	EN(ÆS								•				٠							•		•			•		•			;	29

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ABSTRACT

The Naval Research Laboratory is serving as technical director of the Navy's Air to Air Missile Study. This report represents a continuation of this effort. Results are presented, based on preliminary investigation, which are directed toward establishing the minimum fire control requirements for successfully launching an air to air missile. The investigation was prompted by the fact that as missile system design techniques improve, fire control accuracy requirements should be less stringent. The question arises as to why this trend has not prevailed in the design of modern airborne fire control systems.

PROBLEM STATUS

This is an interim report; work on the problem is continuing

AUTHORIZATION

NRL Problem 53R05-04 BUWEPS Problem RM 3501-001/652-1/F009-01-009

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NAVY AIR TO AIR MISSILE STUDY FIRE CONTROL REQUIREMENTS

INTRODUCTION

This report presents the results of a preliminary analytical investigation, conducted by the Naval Research Laboratory, pointed toward establishing the minimum fire control requirements to successfully launch an air to air missile. Current airborne weapon control systems are complex and consequently require high level maintenance which still does not permit an acceptable availability status.

Systems of the past, such as the F4D Aero 13 had guns and rockets as primary armament. Experience showed that lead-collision rockets were the most effective tactical mode. This lead-collison course has only one instant of solution, where the rocket dispersion pattern results in a high kill probability, during the total attack conversion. It requires that accurate angle and range information be supplied to the computer. Current systems, such as the F3H Aero 19 and the F4H-1 Aero 1A utilize missiles (Sparrow III and Sidewinder) as a weapon. These missiles have some capability of correcting initial errors thus permitting missile launch with considerable angle and range errors in a pure pursuit or lead pursuit mode with continuous firing capability within a given range interval.

With the advent of missiles as a weapon it would seem logical that the tolerances of ang. range and computed parameters could be increased and still provide a satisfactory solution to the problem. This has not been the case, since the equipment designers tend to provide information to a higher degree of accuracy than necessary, because it is within the "state-of-the-art." Such exotic design philosophy increases the equipment complexity and vulnerability to enemy countermeasures. Complexity of circuitry and operational modes is a regenerative process because as system functions become more refined they become more susceptible to the natural environment as well as enemy generated countermeasures and consequently require additional refinement.

It is the intent of this analytical and simulation effort to devise methods of simplifying present system concept and still improve the probability of success through ease of operation, maintenance and improved reliability.

OBJECTIVES

In setting forth on this investigative study effort, certain broad objectives were established based on both analysis of NRL's tactical effectiveness studies and intuitive judgement. These objectives may be summarized as follows:

- a. Define, in terms of probability of arriving at a successful launch point, present capability to solve the fire control problem, both in the clear and countermeasure environment, for the successful launch of today's and future air to air missiles.
- Define actual accuracy requirements for launching air to air missiles.
- c. Specify a system for solving the launching problem of air to air missiles.

To explore the initial objective of defining the Navy's current capability of solving the fire control problem, it was decided to select the most advanced interceptor system about which sufficient information was known to mechanize an accurate simulation.

The approach to this problem was to utilize the F4H-1 cockpit simulation in conjunction with the Reeves Electronic Analog Computer (REAC) located at the Westinghouse Air Arm Division. This simulation provides a pilot position with aircraft control stick, the instruments necessary to fly the aircraft and the APQ-72 search and attack display. The Radar Intercept Officer's (RIO) position is also simulated with the same radar presentation and radar control handle. These operating positions are connected into the REAC which simulates the characteristics of the F4H-1 aircraft and the Airborne Missile Control System (AMCS) Aero 1A (APQ-72 radar and APA-128 computer). A limited effort, although statistically sound, was made for the purpose of establishing parameter sensitivities and trends in quantities that would direct further investigative effort and system simplification taking advantage or insensitive parameters. One of the ground rules that was set forth was that the model (F4H-1 Aero 1A) would be used as mechanized in the initial investigations of the Navy's Air to Air Missile Study, thus establishing a standard to which future data might be compared.

GENERAL SUMMARY

With the simulation verified as representative of the F4H-1 weapon system a program to exercise the simulator was devised. Two hundred conversions were randomly flown in the "Normal Mode" (clear environment). The results of this set of conversions shows 83.7% capability of reaching a successful launch point.

The next step was to investigate the F4H-1 weapon system capability of solving the fire control problem in the "Home on Jam" (HOJ) mode. From the two hundred random conversions in this mode a probability of successful conversion of 73% was attained or 37% of those runs which succeeded under

normal conditions. This would indicate, that under the conditions examined, the system is not sensitive to absolute range. Presently the range information is accurate to within several yards and imposes considerable equipment complexity in the range track and timing circuitry to attain such accuracy. Considerable simplification should be possible in this area and plans are to exploit several schemes—which will be discussed later in the text.

A third sequence of two hundred conversions was flown in the "Acquire on Jam" (AOJ) mode. The conditions for this exercise were that the weapon system never had range and the pilot was orally given range with a lo accuracy of \pm 3 n.mi at normal detection range. It was left to the intuition of the pilot as to when he should fire, based on his ability to sense the proper time, using only the instruments normally in his cockpit.

The pilot was told that he could use any of the information provided in the cockpit to accomplish his mission, but no clues were given him and he was not permitted to review his results until all runs were completed. Under these conditions he was able to successfully launch a missile with a probability of 36% or 43% of those runs which succeeded under normal conditions.

This capability is encouraging since several schemes of system simplification, which will be investigated later, should enhance the pilot's capability in this mode or ultimately negate the need for this mode. The major reason for failure in this mode was that the pilot fired early so that a simple operation on AEW range such as more accurate range or an increased data rate may be sufficient to increase his capability which would also be applicable to the other modes.

A fourth sequence of six hundred conversions was made in an "Attack While Search" (AWS) mode. This mode briefly is one in which the RIO controls the radar antenna to illuminate the target on the center bar of the three-bar Palmer scan in the Search mode. The pilot sees the target each time the antenna scans by and flies the aircraft such that the target is a fixed amount displaced from the center of the scope. When the target is displaced, in azimuth with the proper direction from the center of the scope, a corresponding lead angle is established. By attempting to fly a fixed lead angle under these conditions, the pilot makes his conversion utilizing a deviated pursuit course.

Operating under these limitations the pilot-RIO team was able to press the attack with a respectable success probability. The resulting probability of success varies with the fixed lead angle employed and the results obtained varied from 12% to 59.6%. It is felt that this capability can be

improved by optimizing the simulated system for this mode of operation. Any change along these lines would be in the way of system simplification. The major problem with this mode is the low data rate provided the pilot such that he has a lag in his control of the aircraft since he is accustomed to fly the system closed loop. One obvious method of increasing the data rate by a factor of 2 is to switch the radar to single bar scan after target detection.

This study to date, although all of the data have not been reduced and certain areas need further investigation, indicates that current system mechanization concepts are overly complex.

DETAILS OF SIMULATION

The simulation includes a cockpit mock-up with aircraft surface controls, the pilot and RIO's display, the aerodynamic simulation of the interceptor, and the kinematics relating the interceptor, the 'radar antenna, the target, and a space reference coordinate system. A block diagram showing these interrelationships is shown on Fig. 1. In planning this simulation, consideration of the program objectives determined the extent of component approximation. When indicated, simplifications of the problem are made to enhance reliability and to conserve computer capacity.

Method

The major piece of apparatus used in the study is a Reeves Electronic Analog Computer (REAC). The REAC is used to simulate:

- a. F4H-1 aircraft.
- b. Space geometry existing between the F4H-1 and a target.
- c. Display information generated by the AN/APQ-72 radar and the AMCS Aero 1A Fire Control Computer.

In solating the F4H-1, the basic three-dimensional aerodynamic equations of motion are modified to provide an aircraft which is linearized* in angle of attack and pitch. By imposing these restrictions on the up-down motion of the aircraft, the simulation is limited to co-altitude attacks in which the F4H-1 is allowed to make small perturbations about a fixed altitude. The target is mechanized as a point in space moving with constant speed in a straight line at a constant altitude. Three-dimensional space

^{*}for a linearized angle θ ; $\sin \theta = \theta$, $\cos \theta = 1$

geometry between the F4H-1 and target is mechanized to obtain range and bearing, aircraft orientation angles and rates, antenna signtline angles and rates, and space range components.

The display information principally consists of steering errors, maximum and minimum range information, and allowable launch error. This information is presented to the F4H-1 pilot in the form of an oscilloscope display.

Mock-up

Used in conjunction with the simulated REAC equations is a cockpit mock-up which consists of:

- a. A control stick by which the pilot transmits aileron and elevator commands to the aircraft. Also located on the control stick is the missile firing button.
- b. Instrumentation panel supplying information on altitude and normal acceleration to the pilot.
- c. A five inch oscilloscope on which the display information generated on the REAC is presented. Also on the oscilloscope is a horizon line which supplies roll and pitch information to the pilot.
- d. A human pilot who is used to close the loop on the simulation. The pilot does not require any actual flight experience since previous studies have shown that, as far as the REAC results are concerned, the performance of a properly trained REAC pilot compares very favorably with that of an actual jet pilot.
- e. Colored lights indicating Rmax, Rmin, HOJ Mode and AOJ Mode.

Located in another part of the room from the cockpit is the radar operator mock-up which consists of:

- a. A five inch oscilloscope displaying the identical information presented to the pilot.
- b. A lock-on control handle which enables the radar operator to lock the F4H-1 antenna onto the target.

Display

As mer ioned previously, the pilot and the radar operator receive identical display information through a pair of five inch oscilloscopes. Two types of presentations are available; namely:

- a. search, and
- b. track.

Search Presentation - Normal, HOJ and AOJ Modes

The search display consists of a horizon line, a target dot, an elevation strobe, and a pair of acquisition symbols as shown on Fig. 2. Approximate roll and pitch indication is supplied by the horizon line. The antenna elevation strobe and the azimuth component of the acquisition dot are space stabilized (unaffected by aircraft roll and pitch motions). The approximate position of the radar range gate is indicated by the acquisition symbols, two parallel bars, which are replaced by a range slash at the bottom of the bars when the lock-on button is pressed. The radar operator can position the acquisition symbols left or right, up or down by manipulating the lock-on control handle.

Search Presentation - Attack While Search Mode

The search presentation used in the AWS Mode is shown by Fig. 3. The antenna uses a three-bar Palmer scan in which the bars are separated by $3.75^{\circ} \pm 0.5^{\circ}$ vertically. The total horizontal scan is $\pm 15^{\circ}$ from scan center which can be oriented about the expected position of the target. The scan pattern is seen as a vertical noisy line sweeping back and forth across the scope face. The scope is intensity modulated as a function of target position as shown on Fig. 4.

Track Presentation - Normal and HOJ Modes

The track display, which replaces the search display after lock-on is achieved, is shown on Fig. 5. Pitch and roll information is still provided by the horizon line. Information on aircraft orientation is obtained by the steering error dot. The outer circle collapses to the R_{max} and R_{min} scribe marks as range approaches these values. Closing rate is indicated by the gap in the outer circle which rotates clockwise as closing rate increases. The inner circle represents the maximum allowable launch error for the missile. AI radar gimbal angle deflections are indicated by the elevation and azimuth strobes. The HOJ mode is distinguished visually from the Normal mode by the presence of the HOJ light.

Track Presentation - AOJ Mode

Since no range or range rate information is available for AOJ, the display is somewhat modified. The $R_{\rm max}$ and $R_{\rm min}$ lights do not function and the outer collapsing circle is blanked. The maximum allowable error circle is held at a constant radius of $8.5^{\circ} \pm 2^{\circ}$. A constant range of 3 nautical miles is inserted into the steering equations thereby causing the interceptor to fly an approximate deviated pursuit course at long ranges. The scope display is shown on Fig. 6.

Track Presentation - Attack While Search Mode

Since this mode is flown entirely in search, there is no track presentation.

Switching From Search to Track

At the beginning of each attack, the display is in the search mode. At some time after the beginning of the attack, the target dot suddenly appears on the display indicating that AI radar detection range has been reached. At this time, in the Normal and HOJ modes, the radar operator positions the acquisition symbols over the target dot and depresses the lock-on button located on the lock-on control handle. By keeping the lock-on button depressed, the system locks-on (the display switches from search to track) when the following conditions are met:

- a. Target dot is bracketed by acquisition symbols when lock-on button is initially depressed.
- b. Ten seconds have elapsed since the target was detected.

The ten second time interlock is not a part of the actual weapon system, but is chosen to allow for possible lock-on difficulties in combat.

For the AOJ runs, the system automatically switches from search to track at AI radar detection range; thus, "locking-on" is not necessary. The system always remains in the search mode in the attack while search investigation.

Data Presentation

The data collected from the simulation is recorded in two different forms:

- a. Brush recordings
- b. X-Y plotter

The time histories of all the important simulation variables are recorded on four brush recorders having six channels apiece. A description of each variable is listed as it appears on the recorder.

Recorder 1 - Success or Failure Relationships

a. R - true range, nautical miles

The line of sight distance between the target and interceptor

 $R_{\rm max}$ and $R_{\rm min}$ - first and second pips respectively, indicating the true maximum and minimum aerodynamic range of the missile as determined in the range interlock computer when the correct geometrical quantities are used as inputs.

b. Rdisplay - apparent range, nautical miles

The value of range presented on the display as determined by the systems memorized geometrical inputs

 $R_{\rm max,displey}$ and $R_{\rm min,displey}$ - first and second pips respectively, indicating the maximum and minimum aerodynamic range of the missile as presented on display when the memorized geometrical quantities are used as inputs to the range interlock computer.

c. Emax - allowable launch error, degree.

The maximum allowable deviation in the error plane from the correct interceptor heading for successfully launching a missile when the correct geometrical quantities are used as inputs. The pips indicate the depressing and release of the firing button (pickle).

d. Emaxdisplay - apparent allowable launch error, degrees

The value of allowable launch error presented on the display as determined by the systems memorized geometrical inputs

e. ER - radial error, degrees

The radial deviation from a correct interceptor heading as determined by the vector sum of the true azimuth and elevation steering errors when the correct geometrical quantities are used as inputs.

f. ERdisplay - apparent radial error, degrees

The value of radial error presented on the display based on the systems memorized geometrical inputs.

Recorder 2 - Space Geometry Relationships

a. R - range rate, feet per second

The closing velocity between the interceptor and target as determined in the radar range circuitry as if the target was being tracked in the Normal mode.

b. Rdisplay - apparent range rate, feet per second

The value of range rate presented on the display as determined by the systems memorized geometrical quantities.

c. $V_{\overline{w}}$ - fighter velocity, feet per second

The true air speed of the interceptor.

d. λ_e - Elevation gimbal angle, degrees

The angle between the radar gimbal mechanical axis and the line of sight measured in the plane of the elevation gimbals.

e. λ_{n} - azimuth gimbal angle, degrees

The angle between the radar gimbal mechanical axis and the line of sight measured in the plane of the azimuth gimbals.

f. Y - aircraft heading angle in the horizontal plane, degrees

The fighter's Eulerian angle, wind axis in yaw, with reference to the target track.

Recorder 3 - Basic Aircraft Parameters

a. θ - aircraft pitch angle, degrees

The angular displacement from the horizontal about the transverse axis (y axis) of the interceptor. Pitch angle is positive when the nose is up.

b. • - aircraft roll angle, degrees

The angular displacement from the horizontal about the longitudional axis (x axis) of the interceptor. Roll angle is positive when the right wing is down.

c. p - aircraft pitch rate, degrees per second

The angular rate of change about the transverse axis (y axis) of the interceptor.

d. Q - aircraft roll rate, degrees per second

The angular rate of change about the longitudional axis (x axis) of the interceptor.

e. r - aircraft yaw rate, degrees per second

The angular rate of change about the vertical axis (z axis) of the interceptor. Clockwise rotation is positive.

f. N - load factors, G's

The interceptors lift to weight (L/W) ratio

Accorder 4 - A Check on Recorder A

s. ϵ_{el} - elevation steering error, degrees

The deviation from the correct interceptor heading measured in the plane of the elevation gimbals.

b. ϵ_{8Z} - azimuth steering error, degrees

The deviation from the correct interceptor heading measured in the plane of the azimuth gimbals.

c. $\epsilon_{\text{eldisplay}}$ - apparent elevation steering error, degrees

The systems estimate of time elevation steering error based on memorized inputs.

- d. $\epsilon_{\rm az_{display}}$ apparent azimuth steering error, degrees The systems estimate of true azimuth steering error based on memorized inputs.
- e. ω_{j} elevation gimbal angle rate, degrees per second The angular rate of the line of sight in the plane of the elevation gimbals.
- f. ω_k azimuth gimbal angle rate, degrees per second The angular rate of the line of sight in the plane of the azimuth gimbals.

It can be seen from the above that each recorder has a specific function to perform. Recorder #1 is sufficient in itself to tell whether the attack is a success or a failure. Recorder #2 supplies information to check the space geometry relationships. Recorder #3 provides a check on basic aircraft parameters. Recorder #4 is useful as a check on Recorder #1 since its information may be used to compute RTRUE and RDIS. A sculple brush recording is shown on Fig. 7.

In the Normal, HOJ and AOJ modes parallel computations of true and displayed range, range rate, allowable launch error, azimuth steering error, elevation steering error and total steering error are made. For the AWS mode, the "displayed" variables are undefined since the system remains in Search. In order to evaluate the AWS mode, the six quantities with the subscript (DIS) are replaced with the following:

- A Space stabilized azimuth target position in search (degrees)
- A' Azimuth position of antenna center-of-scan in search (degrees)
- E Space stabilized elevation target position in search (degrees)
- E' Antenna elevation strobe position in search (degrees)

To supplement the information obtained by the brush recordings, R_X and R_Y (the horizontal components of space range) are mechanized and fed to an X-Y plotting board. The result is a plot of range versus angle-off-the-nose in relative target coordinates. At the times when

 R_{max} and R_{min} are equal to range, they produce output pulses which trigger differentiator circuits producing pips in the Y channel of the plotter. Thus, the relative plots also show the range and angle-off-the-nose at R_{max} and R_{min} for each run.

CRITERIA FOR SUCCESS

For an intercept run to be a success in actual practice, the missile must be launched within an allowable launch error and within its aerodynamic range capability. This same success criteria was employed in reducing the data resulting from the simulation effort. For the run to be scored as a success the actual launch error at the time the launch button was pressed (or when interlock permits missile launch) must be equal to or less than the allowable launch error, and the actual range must be less than the maximum aerodynamic range of the missile ($R_{\rm max}$) and greater than the minimum aerodynamic range ($R_{\rm min}$). The allowable launch error was obtained from the following equation:

$$E_{\text{max}} = \lambda + K_3 \frac{R}{R_{\text{max}}} \left| V_C - K_1 V_F \right| - K_2 \left| V_C - K_1 V_F \right|$$

 $E_{\rm max}$ is limited to 15° or less

 $\lambda = 3^{\circ}$

 $K_1 = 0.75$

 $K_2 = 0.0054^{\circ}$ per foot per second

 $K_3 = 0.015$

Vc = closing velocity

Vr = interceptor velocity

The aerodynamic ranges were obtained using the calculated velocities from the geometry for the particular course of interest.

FJPT CONTROL INVESTIGATION

The interceptor is vectored in a horizontal plane along a pure co. .sion course to the point of AI radar detection at an angle τ_0 off the nose of the target. The locations of the interceptor course at detection

are dispersed in a horizontal plane in accord with the normal probability distributions of vectoring errors and detection range with standard deviations of 3 nautical miles and 3.6 nautical miles, respectively (Refs. 1 and 2).

The area in which the possible locations of the interceptor at detection are dispersed is divided into 8 rays 2 nautical miles by 12 nautical miles parallel to the ideal vectoring ray. Each ray is given a statistical weight due to vectoring error distribution. In addition, each ray is divided into 6 blocks 2 nautical miles by 2 nautical miles weighted according to range distribution as shown on Fig. 8.

At lock-on the interceptor pilot maneuvers his aircraft so as to drive to zero any steering errors present. The method of maneuvering is dependent on the type of track mode employed; however, in all cases the interceptor must not exceed 3g's normal acceleration (Ref. 3). All attack modes considered are identical prior to the point of AI radar detection. The attack mode is classified according to the method of operation after detection of the target.

Normal Attack Mode

The purpose of this phase of the investigation was to establish AMCS capability under selected realistic tactical conditions. The results obtained were used as a training medium and as a reference level for determining success in following phases.

In the simulation of the Normal Attack mode there is no enemy countermeasures. The radar operator is prevented by a 10 second timer from completing lock-on sooner than ten seconds after detection. This is considered to be a realistic delay for the detection to lock-on process (Ref. 3). After lock-on, the search display is replaced by the track display which is driven by the airborne computer using the true range and range rate. The pilot then converts to a true lead-pursuit course by flying the steering error dot to the center of the scope and keeping it there. The missiles are launched by depressing the missile launch button on or after the presentation of the $R_{\rm max}$ signal and before the presentation of the $R_{\rm min}$ signal.

Conditions

In this phase of the investigation all attacks were conducted under co-altitude conditions at 50,000 ft altitude. The interceptor velocity (VF) was $V_{\rm max}$ at the start of the run and the target velocity (VT) = M 2.0.

The interceptor was vectored on a pure collision course. After AI radar lock-on the aircraft flies the normal lead pursuit course. Two target aspect angles (τ_0) were investigated, 15° and 30° (Fig. 9). The boxes in the probability grid from which intercept runs were made are as follows:

$$\tau_0 = 15^{\circ}$$
 A-4, B-4, D-3, E-2, F-5
 $\tau_0 = 30^{\circ}$ B-3, D-4, E-2, F-5, G-4

Twenty runs minimum (10 right and 10 left) were made in a random fashion from each of the selected boxes in the probability grid.

The interceptor aircraft employed is the F4H-1. The performance of this aircraft, as simulated, is described in detail in Ref. 4. The missile characteristics used in this simulation are those of the Sparrow III6a and are described in detail in Ref. 5. Some of the pertinent factors are as follows:

$$V_0 = 1000 \left[1 + 0.3 \left(1 - \frac{P}{PSL} \right) \right]$$

 V_{O} = average velocity above launch velocity

$$R_{\text{max}} = R_{1(h)} + T_{1} (V_{C} - V_{F})$$

 $R_{1(h)} = -26.560 \log \frac{P}{P_{SI}} + 11000$

 $T_1 = 11$ seconds for $V_C > V_F$

$$T_1 = -5.95 \log \frac{P}{Pst} + 4.4 \text{ for } V_C < V_F$$

$$R_{\min} = R_{2(h)} + T_2 V_C$$

$$R_{2(h)} = -3442 \log \frac{P}{P_{SL}} + 2200 \text{ ft from 0 to 30,000 ft altitude}$$

$$R_{2(h)} = -10.480 \log \frac{P}{P_{SL}} - 1480 \text{ ft from } 30,000 \text{ ft to } 70,000 \text{ ft alt}$$

P = pressure at altitude

PSL = pressure at sea level

$$T_2 = 4.3$$
 seconds

$$\epsilon_{\rm az}$$
 (az steering error) = $\left[\frac{{\rm Rax}}{57.3} - {\rm V_o~Sin~\lambda a}\right]$ 57.3

$$\epsilon_{\rm el}({\rm el \ steering \ error}) = \left[\frac{Rm_{\rm j}}{57.3} - V_{\rm o} \cos \lambda a \sin \lambda e\right] 57.3 - 0.48 < 3400$$

of = serodynamic angle of attack

on = line of sight rotation rate in azimuth

 ω_1 = line of sight rotation rate in elevation

R = fighter to target range

λa = azimuth gimbal angle

λe = elevation gimbal angle

English bias is assumed correct for all launching stations. Missile gimbal limits are \pm 46 $^{\circ}$ in azimuth and elevation.

The target is of B-47 radar size. The AI radar is as defined in Ref. 6. Its high probability detection capability is 19 nautical miles head-on against the B-47 size target closing at M 3.6. The radar gimbal limits are \pm 57°.

Results

The initial conditions for the two sets of runs used in this phase of the investigation are given on Tables 1 and 2. One hundred runs were made for conditions given on each of these tables (total of two hundred runs). The first column on these tables gives the run numbers 1 through 10, initial aspect angle, whether the run was initiated from the right or left-hand side of the target, and the box in the probability grid. For example 1-15L-A4 is run number 1, $\tau_{\rm O}=15^{\circ}$, left-hand side of target and box A4. The second column gives the range at which the run started (R_O). The third column gives the initial aircraft heading angle (Y_O). The actual detection range (R_d) is given in the fourth column. The initial elevation (λ e_O) and azimuth (λ a_O) gimbal angles are given in the last two columns.

The results of the simulation of these two hundred runs are given on Tables 3 and 4. The number of successes for each ten runs are given. The reasons for the failures are listed. For the group given on Table 3 there were 96 complete runs, 85 successes, 9 failures due to too large a steering error, 2 failures due to failure to fire when permissible and 4 incomplete

runs. Thus there were 96 valid runs. This represents $\frac{85}{96}$ or 88.6% success. The second group of runs yielded 79% probability of success. These runs will be used as the standard for measuring the capability of system operation in degraded or countermeasures environment. The probabilities associated with each box in the detection grid are given on Fig. 9.

Evaluation of the Normal mode simulation results are given on Tables 3.1 through 4.5. The first column gives the run number and consists of runs 1 to 200. The code given in the second column is the same as described previously. The third column tells whether launch occurs between $R_{\rm max}$ and $R_{\rm min}$. The allowable launch error $(E_{\rm max})$ and the actual radial error $(E_{\rm R})$ are given at the firing point and at a point 2 seconds after firing. Two seconds is the time elapsed from "pickel" to the instant that the missile leaves the aircraft. The last two columns list pertinent remarks and describe whether the run was a success or failure.

These results are obtained as follows: The \mathbb{E}_{max} brush recordings for each run is first inspected to determine whether a missile has been fired during the run. If a firing does occur, the next step is to determine whether the firing occurs between R_{max} and R_{min} . This is easily done by observing the range channel of the brush recording (containing R_{max} and R_{min} indications) which is located next to the E_{max} channel as shown on Fig. 7. If the missile firing does occur between Rmax and Rmin, then the run will be considered a success if the maximum allowable launch error $(E_{
m max})$ is greater than or equal to the true radial steering error $(E_{
m R})$ for approximately 2 seconds after firing. Thus, the values of Emax* and \mathbb{E}_{R} are tabulated at time-of-fire and also time-of-fire plus 2 seconds. If at both evaluation points $E_{max} \ge E_R$, then the run is recorded as a success. However, if the condition $E_{max} \ge E_R$ only holds true for one of the two evaluation points, the run is considered marginally successful and is so indicated. If $E_{\rm R} > E_{\rm max}$ for both evaluation points, then the missile firing is assumed to be an error in pilot judgement and the run is labeled a failure.

If missile firing occurs before R_{max} is reached, it does not necessarily imply failure since there is an interlock present in the system which will not allow the missile to be fired until R_{max} is reached. In such a case, the evaluation points do not begin with time-of-fire. The first evaluation is taken at R_{max} and the second evaluation at two seconds after R_{max} has been attained. Determination of success or failure is then undertaken exactly as described above.

^{*}The recorded E_{max} is exactly that determined from the E_{max} equation and can assume any positive value. However, the E_{max} which the pilot observes on his scope is limited to a maximum of 15°. Thus, when reading the results, values of E_{max} greater than 15° should be interpreted as being equal to 15°.

If missile firing occurs after R_{\min} is attained the run is considered a failure with no additional evaluation necessary.

If there is no missile firing at any time during the run, $E_{\rm max}$ and $E_{\rm R}$ are tabulated at $R_{\rm max}$ and also at $R_{\rm max}$ plus 2 seconds. If $E_{\rm R}$ is always greater than $E_{\rm max}$ in this region, the run is a failure due to excessive steering errors. If $E_{\rm R}$ is approximately equal to $E_{\rm max}$ in this region, the run is considered marginally successful, but it is still recorded as a failure. If $E_{\rm max} > E_{\rm R}$ in this region, the run is also labeled a failure even though the pilot could have fired successfully. Runs of this type are indicated by inserting the remark "could have fired" in the REMARKS column of the results.

One other evaluation which has not been previously mentioned is the "Incomplete" run. An incomplete run is one in which one of the initial conditions of the run had been inserted incorrectly but was not discovered until the data was analyzed. These runs are not considered in an evaluation of results.

HOJ Attack Mode

The purpose of this phase of the investigation was to determine the capability for solving the fire control problem in the presence of countermeasures using the current HOJ mechanization. The results will be compared with those of the Normal mode to determine relative capability. In addition, the results will be examined to determine if improvements can be made in this HOJ mechanization.

Conditions

In this phase of the study, the initial conditions are the same as those described in the preceding section for the Normal mode except:

- a. Jammed environment.
- b. It is assumed that the radar has locked on and the computer has settled on a solution before countermeasures start.
- c. The countermeasures continues throughout the run at a level sufficient to keep the system in HOJ.
- d. Continuous angle information is available.

- e. The lead pursuit course computation is based on the last known range and range rate. The effect of integrator drift on the computation of range in the HOJ mode is simulated by adding ± 2.7t + 3 ft per second to the last known value of range rate, where t is the time in seconds after the HOJ mode is initiated.
- f. The HOJ track presentation is similar to the Normal presentation except that a light signals the existence of the HOJ mode. The steering error is reduced by plying the steering error dot to the center of the scope as in the Normal mode. However, due to the degraded range information, zeroing of the steering error dot will not reduce the true steering error to zero.

Results

The initial conditions for the two sets of runs used in the HOJ phase of the investigation are the same as those used in the Normal mode and are given on Tables 1 and 2.

A summary of the results of the HOJ mode for the two hundred simulation runs are given on Tables 5 and 6.

From Table 5, the overall probability of success for Runs 201-300 is 74% and from Table 6, the overall probability of success for Runs 301-400 is 72%. Comparable results given previously for the Normal mode of operation were 88.6% and 79%. Thus, for these runs which succeeded in the Normal mode of operation $\frac{10}{88} = 83.5\%$ and $\frac{12}{70} = 91\%$ succeeded in the HOJ mode. These results are very encouraging and indicate that absolute and continuous range information may not be essential to successful missile launch.

As in the Normal mode, the cases which most degraded the performance are Cases 1 and 10. Case 1 resulted in zero successes per 20 trials and Case 10 resulted in 8 successes per 20 trials. The performance of Case 10 was improved from that shown in the Normal mode due to using a larger initial range beginning with Run 237.

Case 6, which was very successful in the Normal mode, was successful for only four trials in 20 attempts in the HOJ mode. The reason for failure in every instance was a tendency to fire before the true maximum firing range was attained. This phenomenon will probably appear for all further high angle-off courses in subsequent reports. The course begins at 40° off the nose of the trarget and is forced back towards the tail due

to geometry. The value of range rate thus becomes less negative as the course progresses and the actual range closes more slowly than is indicated by the constant range rate fed to the range integrator. Thus the "in-range" light is triggered when the actual range is still too great for a successful launch.

An evaluation for the 200 HOJ runs is given on Tables 5.1 through 6.5. The differences in these tables and those described previously for the Normal mode are as follows:

- a. Column 3 gives the polarity of the drift in the integrator associated with range rate computation.
- b. Both true maximum allowable launch error and maximum allowable error as computed in HOJ are recorded.
- c. The true radial error and the radial error as computed in HOJ are given.

The criteria for success is the same as that employed in the Normal mode except launch must occur between $R_{\rm max}$ and $R_{\rm min}$. In the Normal mode, pressing the launch button before $R_{\rm max}$ is reached will not result in a failure since an interlock prevents launch until $R_{\rm max}$ is reached. This is not the case in the HOJ mode. If the missile firing occurs more than one second before $R_{\rm max}$ is reached, the run is a failure since the interlock is disabled. For early firings of less than one second, the run is termed a marginal failure or an outright failure depending on the values of $E_{\rm max}$ and $E_{\rm R}$ at time-of-fire.

AOJ Attack Mode

The purpose of this phase of the investigation was to determine the capability for solving the fire control problem in the presence of countermeasures using the current AOJ mechanization. The results will be compared with those obtained previously for the Normal mode and HOJ mode of attack. An examination will be made of the results to see if improvements can be made in the mechanization or in the attack doctrine.

Conditions

In this phase of the study the initial conditions (conditions at AI detection) are the same as those given previously for the Normal mode of operation except:

- a. Range information is never available to the AI radar, (angle lock-on only) countermeasures exists throughout the run.
- b. Continuous angle information is available.
- c. Initial range input at the start of the fire control problem is obtained from Airborne Early Warning (AEW) at normal AI radar detection range. The AEW range accuracy is such that $1\sigma = \pm 3$ nautical miles.

In the AOJ mode, lock-on and the initial determination of range and range rate is assumed denied by countermeasures. Thus, the AOJ mode light and the AOJ track display are presented at detection range in this simulation. Since a constant range of 3 nautical miles is inserted into the steering equations, the course is an approximate deviated pursuit course (lead pursuit dictated by a fixed range input) at long ranges when $\omega_{\rm j}$ and $\omega_{\rm k}$ are small. The R term in the $\varepsilon_{\rm l}$ and $\varepsilon_{\rm aZ}$ equations will be 3 $^{\pm}$ 0.5 nimic. The firing interlocks are shorted. The allowable steering error circle is fixed at 8.5° $^{\pm}$ 2°. No range to impact is presented. The range to go circle is blanked. The R_{max} circle is removed and there is no range rate slash.

As stated previously, the range information transmitted from AEW to the interceptor has a distribution such that $lo=\pm 3$ nautical miles. In the simulation a set of random numbers were generated and used in presenting range information to the computer thus giving this distribution.

Armed with this value of range, and knowing his interceptor speed and the approximate target speed, the pilot proceeds to fly the course and try to decide when he is within the missile firing range.

When the pilot feels that he is within the firing range, he depresses the firing button and continues to fly the course. If, after 10 seconds from firing the missile, the pilot is still able to fly the course without experiencing large accelerations, he accepts this condition as an indication that he has either fired too early or that he is flying a head-on attack. If he chooses to assume that he has fired too early, he can exercise his option of firing a second missile. If only one missile is fired in a particular run, the run is evaluated as described previously. However, if the pilot fires early and, realizing his mistake, fires a second time while in the missile launch zone, the run is labeled a success.

Results

The initial conditions for the two sets of runs used in the AOJ phase are the same as those given for the Normal attack phase on Tables 1 and 2.

A summary of the results of the AOJ mode for the two hundred simulation runs are given on Tables 7 and 8.

From Table 7, the overall probability of success for Runs 401-500 is 36% and from Table 8, the overall probability of success for Runs 501-600 is 37%. This compares to 88.6 and 79% success for the Normal mode of operation.

It was found that the method of using the range information obtained from CIC at time of detection is practically worthless to the interceptor pilot for the following reasons. The pilot is supposed to calculate the approximate time-to-go by assuming a head-on attack, thus

where tg = time-to-go

 R_{CIC} = the range supplied by CIC (which may be in error by \pm 6 nautical miles)

 R_{max} = maximum launch range of missile (≈ 6.5 nautical miles)

Vm = target speed

 V_{R} = interceptor speed

 v_T + v_F = 4000 ft per second $\approx \frac{2}{3}$ nautical miles per second

From the above one can see that a quick mental calculation of time-to-go is obtained by subtracting 6.5 from $R_{\rm CIC}$, then multiplying the result by 1.5. Once $t_{\rm g}$ is known, the pilot can mentally count off $t_{\rm g}$ seconds from detection and then fire the missile. The problem which arises is that both the mental calculation and the count off are to start at detection. The pilot must, therefore, do both simultaneously while flying the aircraft. Finally, even if the pilot does the job perfectly, the \pm 6 nautical miles possible error in RCIC indicates that the $t_{\rm g}$ calculated may be in error by \pm 10 seconds.

The entire procedure became so confusing after approximately 50 runs were made, that the pilot began to fire by intuition with no degradation in results. After settling the initial tracking error, the pilot flew the course until normal accelerations of 2 to 2.5 g's were required. At this time he would fire and continue to fly the course. If, after 10 seconds from firing, the pilot was still able to fly the course without experiencing large accelerations, he accepted this condition as an indication that he had either fired too early or that he was flying a head-on attack. If he chose to assume that he had fired too early, he would fire another missile at this time.

An evaluation of the results for the AOJ mode are presented on Tables 7.1-8.5 and consist of Runs 401-600. These results are presented in a slightly different manner than those of the Normal and HOJ modes, the differences being that there is no tabulation of $E_{\rm max}$ and $E_{\rm R}$ for time-of-fire plus two seconds. However, values of $E_{\rm max}$ and $E_{\rm R}$ are tabulated at $R_{\rm max}$ and $R_{\rm min}$ for each run. These are included since, having no range information, the pilot is liable to fire at any time and if he does fire while far from the missile launch zone, there would be no information available concerning steering errors and allowable errors in the missile launch zone. When this information is available, attacks which are failures due to early firings are still useful in that a measure can be made of potential success had the pilot fired in the proper zone.

Attack-While-Search Mode

The purpose of this phase of the investigation was to determine system capability for solving the fire control problem in the presence of anticipated countermeasures techniques by staying in the Search mode of the AI radar.

Conditions

In this phase of the study the initial conditions are the same as those given previously for the Normal mode of operation except in this mode lock-on is not attempted and the search display remains on in narrow-scan throughout the attack. The antenna uses a 3-bar Palmer scan. The bars are separated by $3.75^{\circ} \pm 0.5^{\circ}$ vertically, and extend $\pm 15^{\circ}$ from center-of-scan in azimuth when in narrow-scan. The overall effective narrow-scan pattern is approximately 30° by 12° , and the center-of-scan is positioned horizontally and vertically by means of the radar operator's control handle. The radar operator positions the antenna in elevation by regarding the intensity and frequency of appearance of the target dot. Target intensity varies as a function of the position in the scanned beam.

The scan pattern and the scope display are space-stabilized, with the center of the scope representing dead-ahead along the RGMA longitudinal axis. The pilot obtains the target azimuth angle from the B scope display, and the elevation angle from the antenna elevation marker. Using this angular information he attempts to fly a deviated pursuit course. Therefore, instead of zeroing a steering error dot, the pilot tries to keep the target dot positioned on some predetermined constant azimuth antenna angle.

The signal-to-noise ratio was varied according to the probability of detection in the specific cases and continued to vary as a function of range. The attack course flown was a deviated pursuit course with constant lead angles of 10°, 18° and 25°. Two hundred runs were made for each of these lead angles.

Results

The initial conditions for the AWS investigation are the same as those given for the normal attack phase on Tables 2 and 3.

Tables 9 through $1^{\rm L}$ give the results for the AWS investigation. The percent of successes are given at the bottom of each of these tables. In addition to determining the percentage of successes, the potential successes are also calculated. If, on a particular run, $E_{\rm max} \geq E_{\rm R}$ at $R_{\rm min} \leq R_{\rm max}$ then the run is termed a potential success even though it may have been aborted due to an early or late firing. A condensation of the results are as follows:

Run #	To	Lead Angle	% Actual Successes	% Potential Successes
601-700 701-800 801-900 901-1000 1001-1100 1101-1200	15° or 30°	10° 10° 18° 18° 25° 25°	53 31 59.6 22 39 12	68 53 72.8 49 53 33

Pertinent data related to each of these AWS runs are given on Tables 9.1 through 14.5.

The only difference between Runs 601-700 and 701-800 is that every right-handed attack in Runs 601-700 becomes a left-handed attack in Runs 701-800 and vice versa. However, the percentage of successes and potential

successes are significantly higher for Runs 601-700 than for Runs 701-800. This same phenomenon appears when Runs 801-900 are compared with Runs 901-1000. The lower numbered sets yielded the highest probabilities of success in each case.

The explanation for these differences is that Runs 701-800, 901-1000, and 1101-1200 were flown before the corresponding lower numbered runs in each set and the differences in probability of success reflect the learning process of pilot and radar operator, neither of whom had flown this type of attack previously.

Summary of Results

A condensed summary of the results obtained for all phases of the investigation is given on Table 15. The combined results (probability of success) for all runs associated with each mode is given in Column 2. For the Normal mode of operation this probability of success is 83.7%. Using the Normal mode results as a standard the results given in Column 3 are obtained. For example, referring to Column 2, opposite HOJ, we see that the actual probability of success is 73%. However, under the best conditions (Normal mode) only 87.2% success was available. Thus the HOJ mode is 87% & good as the best mode (Normal) of operation. Comparable results are given for the other modes investigated. The high level of success achieved for all modes is encouraging. In the AWS investigation 10° lead angles yielded the highest probability of success (50.2% of the best available).

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study effort is to establish the minimum fire control remainder to successfully launch an air to air missile. Many people familiar with and qualified in the field of airborne fire control systems believe that these systems have, through an evolutionary process, become overly complex in terms of the desired tactical capability. With the advent of missiles as a weapon, it would seem logical that the tolerances of angle. The predecessor gun and rocket systems and still provide a satisfactory solution to the problem. Such has not been the case, since the equipment designers tend to provide as high a degree of accuracy as the state-of-the-art will allow.

In the preceding sections, data has been presented which describes the tactical capability of the F4H-1 system when used in the various mechanized modes of operation. The results for each mode have been compared and trends

indicated as the input information accuracy is progressively decreased from that available in the Normal mode of operation, to HOJ mode, to AOJ mode and finally AWS mode. It is now important to examine in detail the data recorded for each mode of operation to determine if simple fixes, change in doctrine or pilot-operator judgement can be employed to enhance the operational capability of the system in degraded modes of operation. This in turn will serve as clues to where system simplification could result and still permit the development and employment of a tactically useful system. While the study results presented in this report are preliminary in nature they will provide guidelines for future investigation.

It would be premature to postulate the true requirements for a system to control the launching of an air to air missile at this time. It can be stated that recommendations for simplifying current systems will be forthcoming. Several of these recommendations are being programmed into this study effort for verification prior to final system evaluation. Some of these recommendations and observations are as follows:

- a. From the comparison of the results of the Normal mode and the HOJ mode, it appears that a simple fixed analog of range rate, in a typical lead pursuit course, operating on memorized range would provide the system adequate range and range rate information. The effects of interceptor slow down and changing geometry, in a lead pursuit course, has a much greater effect on range rate than the errors generated due to open loop operation of the ranging system as shown on Fig. 10. Therefore, with range rate corrected for the effects of reduced interceptor velocity and geometric slow down, the sensitivity of range and range rate accuracy can be defined. Another output would be the measure of absolute range rate accuracy requirements as pertains to the needs of the weapon. As an example, the Sparrow III seeker requires range rate to a given accuracy to set the doppler speed gate in the narrow sweep.
- b. Range and range rate are inputs provided the interceptor from AEW or other CIC sources. These should be utilized to the utmost. Such information has associated errors predicted to be $10 = \pm 3$ miles in range and rates of acceptable accuracy. It is the intent of this study to establish by means of the F4H-1 simulation, the capability of using this type range and range rate data as inputs for computed solutions. Airborne missile control systems, as presently configured, have a requirement to provide acceptable range information in the presence of enemy countermeasures. Such ranging schemes are applicable to these conditions and the AWS mode.

Several variations of utilizing the AEW or CIC range and range rate information are contemplated since one has to assume that the data rate to the interceptor may be degradated by either malfunction or enemy totics.

One advantage the interceptor has, when the enemy initiates countermeasures prior to normal detection ranges, is longer detection ranges. The interceptor team may choose not to lock-up on the target at these longer ranges since they have to resolve a particular target in the case of multiple targets and in many cases the probability of successful conversion is enhanced by delaying the initial maneuver.

- c. If the range accuracy requirements can be reduced, the necessity for many of the elaborate range tracking circuits, multipulse width transmitters and receive the do and evaluated. It is conceivable that a single pulse width will be a traight, thus negating the requirement for wide band, back bias receivers, etc. Such a statement may be premature, but further investigation of this area will be made.
- d. The AWS investigation was encouraging and indicates that limitation in this mode is the data rate of target information. In the current mechanization, the scan pattern (30° azimuth and 12° elevation) is too large and the antenna does not illuminate the target often enough. A reduction in size of the scan pattern after detection, to some optimum size, would acrease the data rate and ease the RIO's problem of positioning the antenna on the target. Since the RIO views a "B" scope (vertical depicts range, horizontal depicts antenna azimuth position) presenting it will be necessary to improve the method of indicating the antenna elevation position. Such a mechanization change will be made on the simulator and evaluated as to its sufficiency in satisfying the system requirements. The CW illumination of the target and the rear missile antenna after launch will be one of the parameters considered in optimizing this scan pattern. High on the agenda, however, is to determine if it is mandatory to continuously illuminate the target with CW after launch and if not the duty cycle that can be tolerated.

This type of operation is considered to be the goal in system simplification, since the equipment complexity would be reduced and the AMCS would not be susceptible to most enemy countermeasures.

e. From the results of the efforts to date, several trends have been established where certain parameters vary in a pattern that could be a clue to the interceptor team for solving the problem. Several of these trends, listed as follows, will be investigated and further developed by additional simulation.

- l. The range rate variation seems to fall into a pattern which lends itself to approximation as mentioned previously and thereby should provide a voltage that is an indication of range. Apparant range rate will more closely approximate true range rate in the simulation. The data from additional conversions will be evaluated to establish, when the approximated range rate drops to a given percentage of the initial range rate, that true range is within the firing zone.
- 2. Roll angle appears to follow a pattern and the sign of the roll angle adds sense or polarity to this pattern. It is conceived that, given knowledge of the roll angle characteristics, the pilot could fly a deviated pursuit course until his roll angle reached a given value at which time he would modify his roll angle, in the direction of problem solution, to establish a known displacement. With a known displacement in roll angle, other quantities, such as rate of change of line of sight, etc., will vary such as to provide an estimate of range.
- 3. It has been noted in the simulation to date that roll angle and acceleration stabilize near the maximum.
- 4. The elevation and azimuth gimbal space rates of the line-of-sight tend to stabilize at some low constant value for runs experiencing essentially zero steering errors.
- 5. The success of the HOJ mode may be improved to that of the Normal mode, with a simple interlock time delay limiting the release of the missile before true R_{max} . This time delay would function for approximately 2.0 seconds after indicated R_{max} appears on the scope before the missile would be released. A cursory evaluation of 200 runs in the HOJ mode indicates that the steering errors at the time of missile launch would also be improved by a time delay.
- f. In view of the fact that several areas of system improvement through simplification have been spotlighted, it is strongly recommended that this investigation of the minimum fire control requirements be continued by the Navy.

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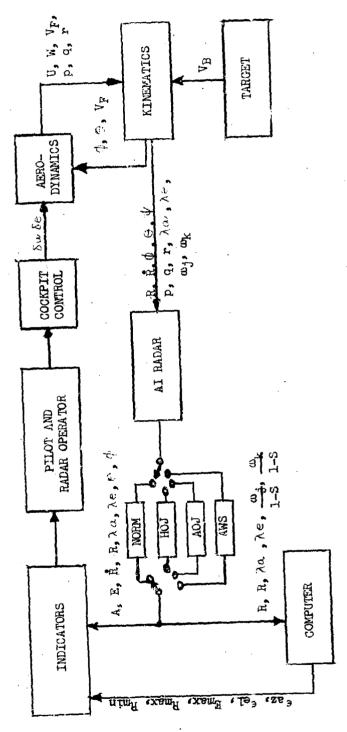
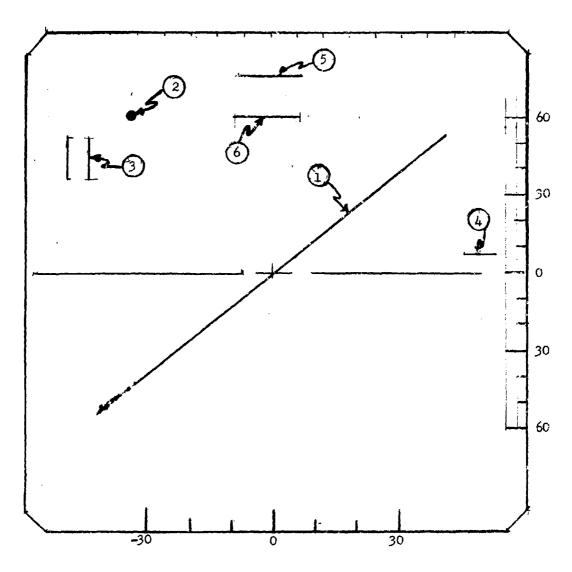
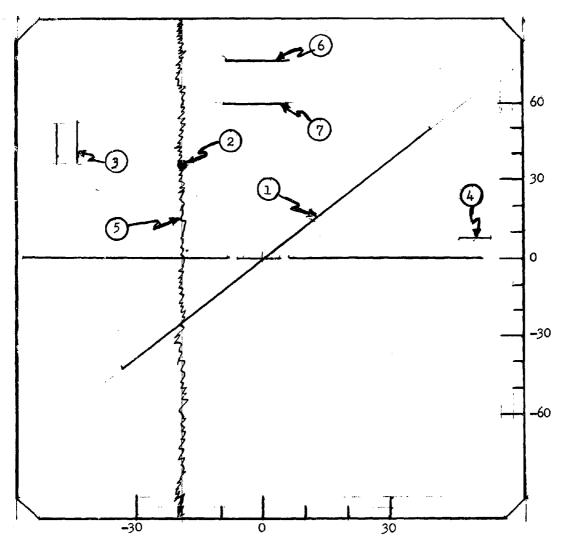


Figure 1 Block Diagram of Simulation



- Roll Bar
- Target Dot
- Acquisition Symbol Target Elevation R_{max} Scribe Mark B_{min} Scribe Mark

Figure 2 Search Display-Normal, HOJ and AOJ Modes



- Roll Bar l.

- 2. Target Dot
 3. Acquisition Symbol
 4. Target Elevation
 5. Anterna Azimuth Sweep
 6. R_{max} Scribe Mark
 7. R_{min}

Figure 3 Search Display - AWS Mode

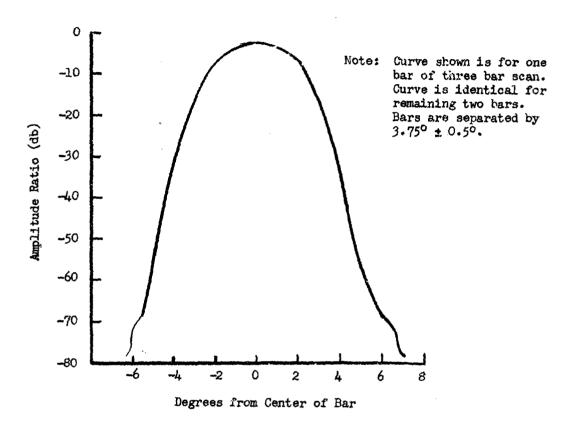
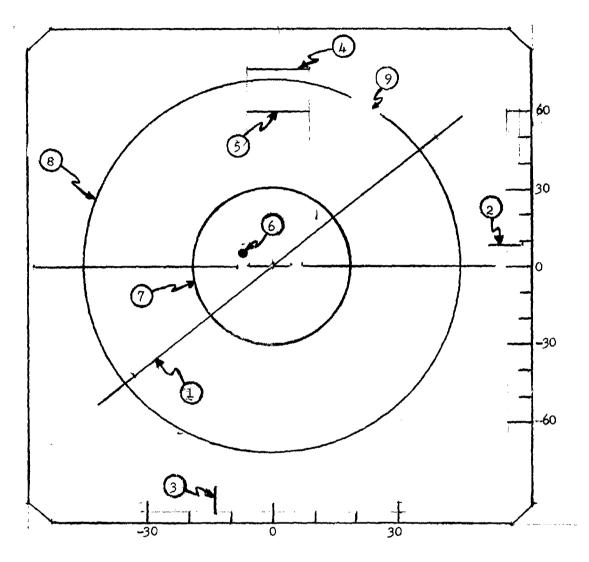


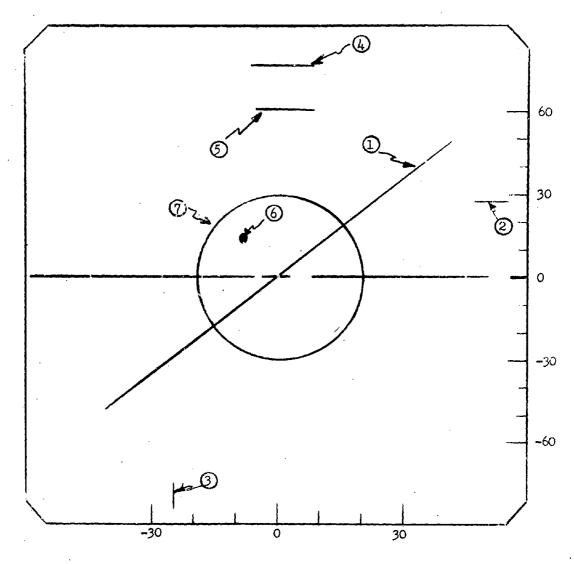
Figure 4 Scope Intensity as a Function of Distance from Center of Bar, Elevation Channel.



- Roll Bar Elevation Gimbal Angle Azimuth Gimbal Angle R_{max} Scribe Mark

- R_{min} Scribe Mark Error Dot Maximum Error Circle R_{max} R_{min} Circle Range Rate Gap

Figure 5 Track Display - Normal & HOJ Modes



- 1. Roll Bar
- 2. Elevation Gimbal Angle
- 3. Azimuth Gimbal Angle
 4. R Scribe Mark

- 5. R_{min} Scribe Mark 6. Error Dot
- 7. Maximum Error Circle -Constant
 - diameter = 8.5°

Track Display - AOJ Mode Figure 6

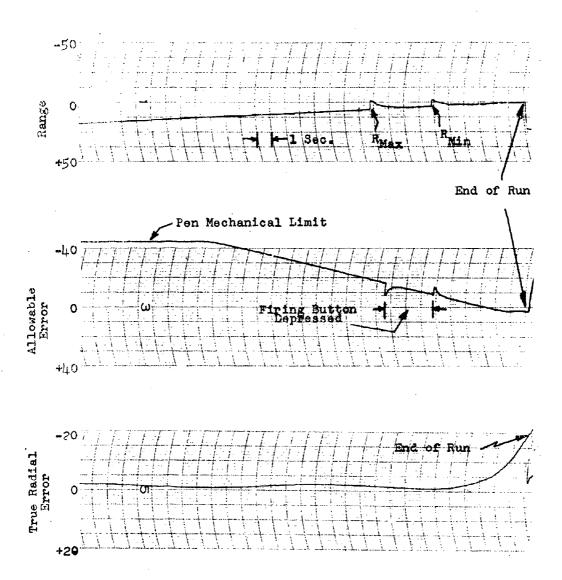


Fig. 7- Sample of Brush Recording Condition 3-151-03 (Run 137)

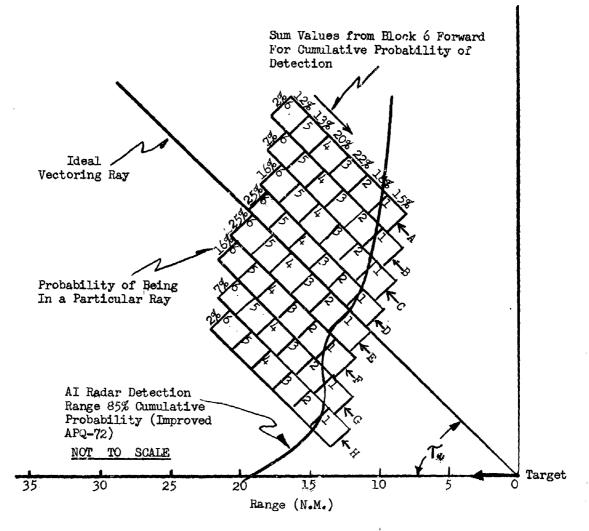


Figure 8 Weighting Factors Due to Vectoring Error and Detection Probability Distributions

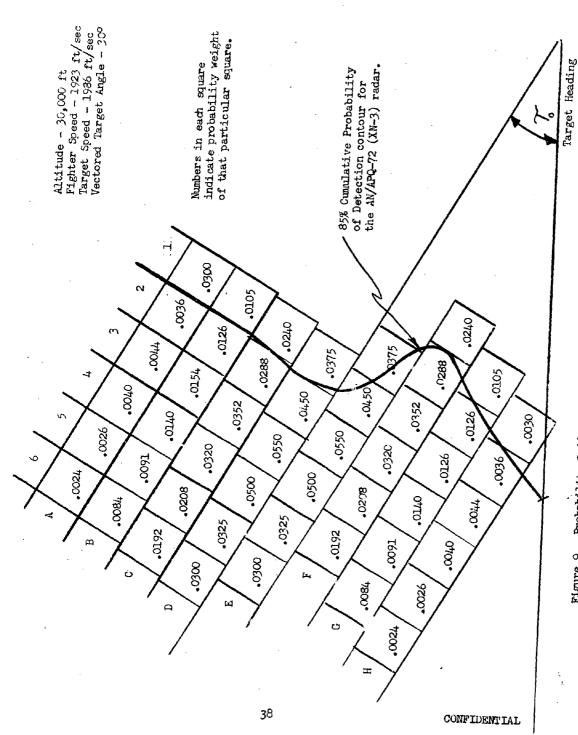
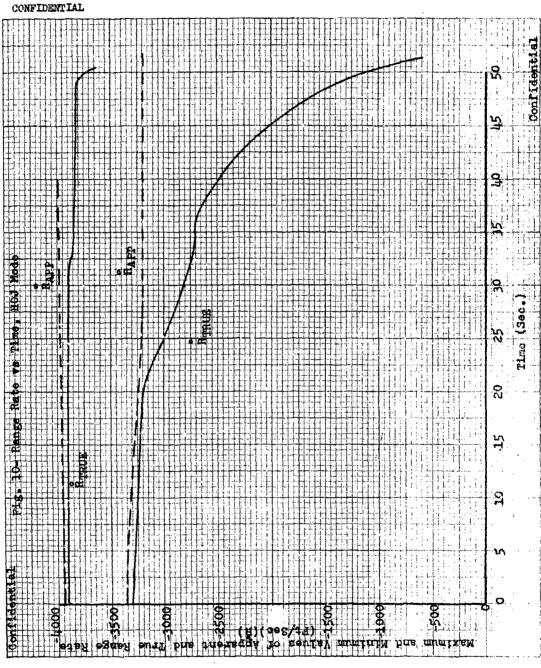


Figure 9 Probability Grid and Detection Probability Distributions



Code #	Ro Initial Range (n.m.)	Vo Initial Air- craft Heading (deg)	Rd Detection Range (n,m.)	À≘o Initial Elec. Gimbal Angle (deg)	Ac. Initial A _X Gimbal Angle (deg)
1-15R-A4	29.2	. +30	22.4	69*0-	- 1-1
2-15L-C4	27.75	-30	20.72	-0.68	80.88
3-15R-D3	24.5	+30	17.5	-0.675	-12.7
4=151-E2	22.9	-30	15.85	859*0-	+17.5
5-15R-F5	30•45	0£+	23.45	949*0-	-20.6
6-30L-B3	27.35	Ó9 -	20.5	-0.65	+19.5
7-30R-D4	29.65	09+	22.7	809*0-	-28
8-30L-B2	23.85	09	16.85	-0.581	+32.3
9-30R-F5	28•4	09+	19.55	-0.553	-36
10-30L-G4	27.4	09-	20•35	-0.523	+40.5
10-301-65*	29.15	09-	22.25	-0.45	+39.7
			TABLE 1		

Initial Condition Set No. 1 Used for Runs #1-100, 201-300, 401-500, 501-700, 801-9000, 1001-1100

*From Run #237, G5 is used rather than G4

- 1		T	(1)		1
	λα _o Initial A _X Gimbal Angle (deg)	+ 1,1	8.8 -	+12.7	-17.5	+20.6	-19.5	+28	-32.3	+36	-40.5	-33.7	The second secon
	λe _o Initial Elec. Gimbal Angle (deg)	69°0-	89*0~	-0.675	-0.658	949*0-	-0.55	809*0-	-0.581	-0.558	-0.523	-0.45	The state of the s
	R _d Detection Range (n.m.)	.22.4	20•72	17.5	15.85	23.45	20.5	22.7	16.85	19•55	20.35	22.25	
-	Ψο Initial Air- craft Heading (deg)	-30	+30	-30	+30	-30	09+	-60	09+	09-	09+	09+	
	Rollitial Range Initial Air- I (r.m.) (deg)	29.2	27.75	24.5	22.9	30.45	2/1.35	29.65	23.85	.28•4	27.4	29.15	
	C.de #	1-151-44	2-15B-C4	3+151-03	4-15R-E2	5-151-85	6~30L~B3	7-30L-D4	8-30R-E2	9-30L-F5	10-30R-G1	10-30h-G5*	The state of the s

TABLE 2

Initial Condition Set No. 2 Used for Runs #[01-200, 301-400, 501-600, 701-800, 901-100, 1101-1200

*From Rum #237, G5 is used rather than G4

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L	11¢		82	9	9	<u> </u>	8
	Totals	+	36	9	2	7	8%
	1-15R-A4 2-15L-C4 3-15R-D34-15L-E2 5-15R-F5 6-30L-B3 7-30R-D4 8-30L-E2 9-30R-F5 10-30L-C4/5	ı	2	m			5
	10-30	t	, e	3			2
	-F5	į	٤				2
	9-30R	+	4	1			~
	ద	1	5		·		5
	8-30I	+	5				5
۲,	1-D4	_	5				5
et M	7-30E	+	5				5
Summary of Results, HCJ Mode, Set No. 1	LB3	-	٦ .		7		5
S	06-9	+	7		7		5
s, H	3-F5	ı	5				5
sult	5-15	+	3				5
of Re	[-E2	1	5				5
ary (4-151	+	†₁			7	41
Sum	SR-D3	ı	30				5
	3-1	+	'n				5
	7T-C4	ı	ž				5
	2-1	+	5				и.
	5R-A4	r		3	8		5
	1-1	+		8	, m		77
	Code	Polarity of R Drift	Successes	Failures Due Io Steering Errors	Failures Due To Firing Before True A _{max}	Failure Is Fire When Permissible	Total Runs Made

Total No. Valid Runs = 100

Total No. Successes = 74

Percent Success = 74

TABLE 5.1

Results of Simulation

CONFIDEN	PIAL			Evaluation ²		1		:	,					-	S	(IZ4	5	2	2	2	[24]		[24	2	S
				Evalu		() ((24	S	(A)	-			S	43								1			
				Remarks						*			·			Could have Fired*						**			
			After Firing	H OF	(Deg.)	3	3	1		200	74	2	4	3	5.5	6	2	53	4	4	r-1	220	0.5	<u>-</u>	Н
			After	En True	(Seg.)	3	3.5	1.5	1.5	02 23	2	2.5	4	3	77	8	2	4	1	7	4	8	Q.	-#	17
			Sec	H. H.	(Deg.)	8.5	9	Ħ	92	75	=	œ;	ន្ត	10.5	7	듸	10	6	自	1	5	2	9.5	टा	6
	цо :	2	Data 2		(Deg.)	8	Ħ	_ 1	2	Ħ	6	8	6	∞	80	97	01	Ħ	9	6	10	75	임	8	80
٦.	Results of Simulation	on Set		混정	(Deg.)(Deg.)(Deg.)	6.5	3	1.5	?	8	4	4	δ	- 9	3.5	27	2	0.5	4	2	5	28	0.5	8.5	2
TABLE 5.1	. St	luatio	Firing Point	ER True	Deg.)	9	9	2	۲۰	8	7	3.5	6	5.5	4	22	2	0		5	¢.	R	1.5	8	2
€ -	alts	Fva.	Firt	Emax HOJ	(Deg.)	77.	77	77	7	77	15	75	7,	7	97	779	17	7,	17.2	35	7	13	27	9	13
	Res	HOJ Mode, Evaluation Set. No. 1	Data at	Emax True	(Deg.)	77	15	16	16	16	77	13	† ₹	13	17	16	16	16	1/4	13	15	7.7	13	7,7	13
				ш	nimax of rmin	yes	Fired 1.5 sec	yes	Sev	Not fired	yes	yes	yes	ves	yes	Not fired	ves	Yes	Yes		Fired 2 scc. Before Rms r	Not fired	Fired 1 sec.	yes	yes
				Rolarity of Drift	# # #	-	ı					ı	1	-	,	+	+	+	+	+	+	+		+	4
				Code		8-30L-E2	1-15R-44	3-15R-D3	2-151-07	10-301-C4	7-30R-D4	5-15R-F5	4-15L-E2	9-30R-F5	-	4-151-52	3-158-13	2-15I-Ct	8-301-12	7-30R-D4	1-158-44	10-30L-GL	6-30L-B3	9-30R-F5	
				Run No.		201	202	203	200	205	8	202	208	200	012	777	25	213	27.	215	216	217	218	210	220

For data at firing point, values given for true Kmax. For data 2 sec. after firing, values given 2 sec. after frue Kmax. Notes:

For definition of code, refer to text.

9. The missile is successfully lumched.

F. An attack failure occurs.

I. hun is incomplete.

9. Feful range of Emax is 0 to 15 degrees. 75

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TABLE 5.2

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Results of Simulation

,			CIT	noe roue, myaraacton bee me.							;	
	,	7	Data a	ıt Fir	Data at Firing Point		Data 2	Sec	After	Data 2 Sec. After Firing		
Codel	rolaricy of Drift in R	True ⁴ min	Emax True (Deg.)	Emax Hoj (Deg.)	Emax ER HOJ True (Deg.)(Deg.)	ER HOJ (Deg.)	ER Emax En HOJ True HOJ True Deg.)(Deg.)(Deg.)(Deg.)	Emax HOJ (Deg.)		Hou (Ceg.)	Remarks	Lvaluation ²
9-30R-F5	1	yes	10.5	ង	6.5	٥	5	OT	e.	ω,		S
10-30L-C/4	,	Not fired	17.5	16	> 20	20	12.5	12.5	> 5 0	>20	非	L
4-151-2	;	yes	15	77	7	>7	6	9.5	3	4		
1-15R-¼	1	Fired 2 sec. Before Emax	316	15	3.5	1	75	2	2	5	i	<u>рт</u> .
2-151-04		Yes	16	774	3	3	12	9.5	2	1.5		u:
3-15E-D3		Yes	16	1.4	1.5	1.5	ㅋ	6	1.5	7.2	:	တ
7-30R-DL	,	Yes	13	77	1.5	2	10	Ξ	3	~	-	ζ(V)
5-15R-F5	ı	yes	77	12.5	3	5	₩	₩	2.5	3		-)
6-30L-53	•	Fired 1.5 sec Before Rmay	† 7 7	13	8	Н	Ħ	10	ω	∞		£4,
8-30L-E2	1	yes	25	5	2	2.5	77	7	1.5	7		S
1-15B-A4	+	Fired 2 sec. Before Rmax	15	7	6.5	i i	12	6	3.5	i		£2-4
2-151-04	+	yes	79	77	1.5	-1	2	9.5		1.5		5
8-301-E2	-+	yes	97	7	7	L	ន	디	1			S
6-301-B3	+	Fired 1.5 sec Before Amax	77	12.5	4	4	#	30	: 	9		ţr.
5-15R-F5	+	yes	<u>చ</u>	12	-1	4.5	ಳು	7.5	10	2	:	ι
9-30R-F5	+	yes	77	16	9	9	S	12	 	3.55	!	ادر
1.58-03	+	yes	16	17	7	73	22	9.5	7	7		נט
51-E2	+	sañ	114	77	₩	8	∞	2.5	4	7		(1)
301-C5	4	Not fired	18.5	18.5	> 20	82	13.5	16	8	25	xic .	iz.
OR-D4	+	yes	77	176	1.5	2	2	2	14	N		υ ς

For data at firing point, values given for true Fymax. For data 2 sec. after firing, values given 2 sec. after true Hymax. Notes:

44

For definition of code, refer to texi.
5 - The missile is nuccessfully launched.
F - In attack failure occurs.
I - Kun is incomplete.
Ureful lange of Emax is 0 to 15 degrees.

TABLE 5.3

Results of Simulation

CONFID	entl	AL		72			1					~				i				1			
				Evaluation ²	S	8	3 Cs.	on the	S	5	5	Įžų.	c/3	S	24	S	Ø	S	8	-	Ø	ļz,	V
				Remarks			*		:		. }	·			, **								
			firing	F. HOU HOU (Deg.)	2.5		15	2	7	7	7	1.5	7.5	\` `	8	2.5	<u>_</u>	1.5	}	의 (5	3	d
			After 1	FR FR True HOU (Deg.)	3	5	180	2.5	-1	7	7	8	7.5	. 7	88	2.5	7	1.5	,,	13	5	3	0
			Sec	E San	∞	22	d a	6	2	9	1.5	2	ន	72	1	ļ	3	2	9.5	77	엄	10,5	9.5
	цо	No. 1	Data 2 Sec After Firing	Frue True (Deg.)		∞ 0	2	9	11.5	2	ន	01	11.5	11.5	33	೫	9/	7	30	ឧ	8	Ħ	12
5.3	mlati	n Set		Dek.	2.5	9.	77	2.5	5.5	,-	-3	-7	11	6.5	क्ष	2	8	2.5	~	22	80	8	1
Table 5.3	Results of Simulation	luatio	ng Poj	Fr. True Deg.)	3	5	3	2.5	5.5	-	4	2	11	6.5	•	~	14.5	3	,	35	60	٦	-
H	sult,s	Eva	Firi	Emax HOJ Peg)	7	97,	12	77	16	15	77	7	7,7	97		3	9,	16	77	13	15	4	74
	Re	HOJ Mode, Evaluation Set No. 1	Data at Firing Point	Emax True (Deg.)	77	7,5	¥ 7	33	17	17	77	77	† ,	76	82	15	14.5	77	15	97	13,	47	16.5
			Pina	. 9g ef	yes	yes	Not fired	yes	yes	Yes	397	Fired 1 sec. Before Rmax	yes	yes	Not fired	yes	yes	yes	yes	yes	yes	Fired 1 sec. Before Rmax	Yes
			Polamity	of prift in		•		,	3	i	1	ı	-	+	+	. +	+	, ! +	+	*	+	. +	+
				Codel	3-15R-03	9-30R-P5	1-158-14	5-15R-F5	8-301-E2	2-15L-C4	7-30R-D4	6-30L-B3	4-15I-E2	8-301-E2	10-301-65	3-15R-D3	4-151-52	7-30R-D4	5-15R-F5	1-15R-44	9-30R-F5	6-30L-B3	2-151-C4
	·		-	Run No.	क्ष	222	717	24.5	2,6	24.7	248	577	250	<u> </u>			254	255	256	257	258	259	365

For data at firing point, valuergiven for true R_{max}. For data 2 sec. after firing values given 2 sec. after true R_{max}. 4.5

For definition of code, refer to text. 5 - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Trax is 0 to 15 degrees. 3.

*

Notes:

TABLE 5.4

Results of Simulation

		-		.,			7															
	Eveluation2		, Da	v.	ž 12.	, 62	i. 03) 579	14	: .	1	(2 0)) (:) (z.	07	i i	i i, wi) (:	l fr	κά	v:	(s.
	Semarke				ijŧ		:		: :					: aje					Marginal Failure		:	a¦¢
Firing	: af 2	[reg.]				-		· (m)	72		۲ -	t	10	13	, (4	, W	, ,	15	2	1.5		. 27
fter	The Land	Deg	1				1			بم أ	1-			11.1		m		1	8	1.5	4.5	202
Sec	, X3	(Leg.,	ļ	9.5	\ \	2	80	75	10	ç	0 0	72	121	77	6	०	0	3	Ħ	<u> </u>	75	60
Data 2	Frank True	(Deg.)	: '^	∞		10	7.5	6	9.5	. 0	; c	ن ت	, SI	2.6	6	9	7	2	9.5		8	9
int	HO.	(Deg.)	2	B.5	2	2	2	6.5	W	. (1	/α	۳ (101	16	2	ω, 	2.5	5	2	7.5	7	18
ing P	म् इ	(Deg.)	6	00	15	2	2	6.5	-4	۲۰	γα: 	א'מ	~	91	,	4	3	2	3	5	3.5	ଷ୍ଟ
t Fir	HOH	Deg				14.5	13	16	77		14	9	; ;===================================	18	2	17.7	7	16	774	16	16	. ,
Data a	True	(Deg.)	10	13.5	77	15	2	オ	শ	===	7	27	ຕ	2	73	. 6	77	12.5	ន	검	. 75	2
	Be.	r sage	Yes	yes	Not fired	Yes	yes	•	⊣ თ	VES	yes	Yes	yes	Not fired	yes	yes	Yes	Ves	First 0.75 sec. Before Finax	yes	yes	Not fired
Folarity	of Drift in Å		1.	1	1	1	1:	;	1				+	+	*	+	*	+	4	+ .	+	+ :
			10-301-65	4-151-E2	1-15B-A4	2-121-04	5-15R-F5	8-30I-12	6-301-83	3-158-03	9-30R-F5	7-30:-14	3-158-03	9-30K-F5	7-727-55	2-151-04	5-126-151	8-3012	5-301-B3	10 +11-65	7-30r-14	1-158-14
f	ž Š		261	262	263	564	265	265	1 267	268	269	270	27.1	232	273	.274	255	276	27.7	278	279	780
	Folarity Fired Data at Firing Point	Fired Data at Firing Point Data 2 Sec After Firing Between True Fmax A Fmax A Fmin True HOJ T	Code of Drift Between True Fmax Fmin Fol True HOJ True HO	Code ¹ of Drift Between True Finax ER ER Emax ² Emax ³ Emax ER Expension True HOJ	Code ¹ of Drift Between True Emax ³ Emax ER ER Emax ³ Emax ³ Emax ER ER Emax ³ Em	Code ¹ of Drift Between True Emax ³ Emax ER ER Emax ³ Emax	Code ¹ of Drift Between True Emax Emax BR Emax Emax Emax Emax & Rmin (Deg.) (D	Code ¹ of Drift Between True First Point Data 2 Sec After Firing Forlum for Data 3 Sec After Firing Forlum for Data 4 Sec After Forlum for Data 4 Sec After 5 Sec After Forlum for Data 4 Sec After Forlum for Data 4 Sec After 5 Sec After Forlum for Data 4 Sec After 5 Sec After 5 Sec After 5 Sec After Forlum for Data 4 Sec After 5 Sec After Forlum for Data 4 Sec After 5 Sec After 5 Sec After 5 Sec After Forlum for Data 4 Sec After 5 S	Code ¹ of Drift Between True Fmax Emax ER Emax ² Fmax ER EMAX ER EMAX EMAX ER EMAX EMAX EXCHANGE TO EMAX EX EMAX ER EMAX EMAX EX EMAX EX EMAX EX EMAX EMAX	Code ¹ of Drift Between True Fired Data at Firing Point Data 2 Sec After Firing Formation of Drift Between True Hod Tru	Codel of Drift Between True First Roll Emax Remax Remax Remax & Finax Emax Remax Rem	Codel of Drift Between True Fired Data at Firing Point Data 2 Sec After Firing Codel of Drift Between True Fmax Emax ER ER Emax En Ell Emax Ell Emax En Emax	Codel of Drift Between True Fired Data at Firing Point Data 2 Sec After Firing Codel of Drift Between True Fmax Fmax ER Emax En Emax Er Emax In Raax & Rmin True HOJ True HO	Codel of Drift Between True Fired Data at Firing Point Data 2 Sec After Firing Codel of Drift Between True Fmax Emax ER ER Emax En E. In Raax & Rain True HOJ True	Codel of Drift Between True Fired Data at Firing Point Data 2 Sec After Firing Codel of Drift Between True Fmax Fmax ER Emax Fmax In f Rmax & Rmin True Hou True Ho	Codel of Drift Between True First Point Data 2 Sec After Firing Fired of Drift Between True Fmax Emax Expansion Filed Fmax & Emax Emax Expansion Filed Fmax & Emax Emax Expansion Fmax Emax Expansion Fmax & Emax Emax Emax Emax Emax Emax Emax Emax	Code-1 of Drift Between True Fmax FR ER Fmax Frax Er Frax From Code-1 of Drift Between True Hold	Code-1 of Drift Between True Emax of Emax Fired Data at Firing Point Data 2 Sec After Firing 10-30L-65 In f Hmax & Rmin True HOR HOR HOR HOR HOR HOR HOR HOR HOR <t< td=""><td>Code-1 of Drift Between True Fmax Emax FR Emax From Fig. 1. Separate Evaluation of Drift Between True Hold True Hold</td><td>Codel of Data at Firing Point Data 2 Sec After Firing Fund in Ranx & Rain Deg.) [Deg.] Emax & Emax & Rain Deg.] [Deg.] [Deg.] [Deg.] [Deg.] [Emax] Emax & Rain Deg.] [Deg.] [Deg.</td><td>Code-1 Colarity Fired Data at Firing Point Pate 2 Sec After Firing 10-304-0f in f Hmax & Rmin True HOJ HOJ</td><td>Code¹ Colority Fired Data at Firing Point Data 2 Sec After Firing Fund Fired Fired Fund Fired Fund Fired Fund Fund</td></t<>	Code-1 of Drift Between True Fmax Emax FR Emax From Fig. 1. Separate Evaluation of Drift Between True Hold	Codel of Data at Firing Point Data 2 Sec After Firing Fund in Ranx & Rain Deg.) [Deg.] Emax & Emax & Rain Deg.] [Deg.] [Deg.] [Deg.] [Deg.] [Emax] Emax & Rain Deg.] [Deg.] [Deg.	Code-1 Colarity Fired Data at Firing Point Pate 2 Sec After Firing 10-304-0f in f Hmax & Rmin True HOJ HOJ	Code ¹ Colority Fired Data at Firing Point Data 2 Sec After Firing Fund Fired Fired Fund Fired Fund Fired Fund Fund

For data at firing point, values gien for true Rmax. For data 2 sec. after firing, values given 2 sec. after true Emax. :1: Noten

4 %

For definition of code, refer to text.

- The missile is successfully launched.

- In attack failure occurs.

- Fun is incomplete.

| Secful range of ham is C to 15 degrees. ۰,۳

TABLE 5.5

Results of Simulation

	r	Evaluation	8	S	**	20	0.		2		(Sec		8	2	S	S	8	S	S	S	<u>.</u>	6	2	2	
		Remarks			ì															_		1	1		į
	Firing	ER HOJ (Deg.)	1	6.5	13,	4	2.5	1	7	-	·		6.5	Ĺ		2	7	5	2	7		-	7	~	
	fter	Egg Egg	-	9	17	2	2.5	7	7	-	_	7.7		20		+-	3.5	5.5	+-	5		3	3	m	
	Sec	E Dec. X	2	12	1	77	9.5	9	2	9.5	;	‡_	0	100	2	9	1	12	5.6	13		3	6	77	
my was Emlistion Set No. 1	Data 2 Sec After Firing	Emax True Deg.)	q	60	12.5	8	9.5	Ħ	F	9.5	1	∞	c	\	10	٥	90	35	15.5	8	3.	3	9	92	1
n Set	int			700	13	8	2	2	24	6		-	5	3	1	1	2 2	90	10	10	ľ	ъ. ·	1.5	L	
metio	ing Pc	E. True	- 1	70	15.	œ	2	~	١,٠	J.	*	1.5		9'	7.		7		7	70	+-	<u> </u>	64	7	3
· į	Fire Fire	Emax Fr.	0	97.	95	12	15	1,5	14		<u>.</u>	<u> </u>		4	7	2	1	5	<u>:</u>	***	9	<u>a</u>	13	拃	3
T Made	Data at Firing Point	Enax True	1000	27	742	1	7:	1/2	2 7	- 1	1	ㅁ	- 1	7	13	13	2	73		81	7		C	1	7
<u>e</u>	2	Fired Between Irus Rmax & Rmin		yes	Yes	New York	Yes	yes	Yes	yes	Yes	Fired 1 sec.	Before irue max	Yes	Yes	yes	yes	Yes	ува	yes	Trees yes	an an)	Yes	yes
		Polarity of Drift in R		•				1	1	•	•			-	*	+		+	+	+	+	+		+	+
	h	Code		7-30R-104	10-301-05	1-128-17	9-30R-F5	3-15R-03	2-151-C4	8-30I-E2	5-15R-F5	20.100	Ca-305-0		+	_}_	٠.	4			10-30L-G5			6-30I-B3	-
		Run No.		283	282	283	284	285	286	287	286	3	788	18	3		700	220	200	200	262	300	2	299	38

For data at firing point, values given for true Pmax. For data 2 sec. after firing, values given 2 sec. after true Rmax. * Notes

4%

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Emax is 0 to 15 degrees. 3.

HIE 6

						Sum	nary	of R	Summary of Results, HOJ Mode, Set No. 2	S, H	OJ Mo	de,	Set 1	lo. 2							-	AL
Code	1-15	L-A4	2-15	R-C4	3-15	60-3	4-154	- 2	5-138	E3	6-30	64-1	7-301	and -	-30E-	£2 6)-30I	-F5	10-30	1-151-44 2-15R-C4 3-151-D3 4-15R-E2 5-15R-E2 6-30R-B3 7-301-D48-30R-E2 9-301-F5 10-30R-C5	Totals	3.5
Polarity of R Drift	+	1	+	1	+	,	+	ı	+	1	+		+	ı	+	ı	+	ı	+	ı	+	1
Successes			3	5	2	3	2	- 7	2	7	н	러	5	5	5	5	3	4	3	1	37	35
Failures Due To Steering Errors	5	5				_							·				1		П	3	7	8
Failures Due To Firing Before True Rmax						,					77	77						•	,		4	-4
Failure to Fire When Permissible	7)							-									Н	н	į	T	8	3
Total Runs Made	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	π,	5	क्र	8

Total No. Valid Runs = 100

Total No. Successes = 72

Percent Success = 72

TABLE 6.1

Results of Simulation

-		Svaluation ²		တ	بدا	တ	S	D-4	sa.	S	S	တ	12- 4	S	S	S	S	S		S	β.	(Aq	53
	·	Eenarks			*			Could have											×		Marginally Early Firing	*	
-	Firing	品品	(Deg.)	2	8	1.5	8	11.5	1	2,5	5.5	2.5	7	5	2	2	3	7	គ	4	2	12	0.5
	After	F. B.	Deg J Deg J	2.5	13	2	i	ជ	1.5	3	5.5	7	7	5	7	7	3	-	12.5	3-21	e)	77	0.5
	Sec	A XX	(Deg.)	T	9	5.5	10	15.5	10.5	9.5	6	10	23	9.5	10.5	10.5	F	2	6	2	임	1.5	8
No. 2	Data 2 Sec.	Emax True	(Deg.)	ć	to	J.	10.5	Ħ	6	ω	8	7	6	80	10	ន	9.5	8	∞	R	₩	11	₩
on Set	int	전:	(Deg.)	6.5	or	2	2	#	1	3	5.5	9	3	8.5	2	3	7	1.5	77	٣	5 -7-	15.5	П
luation	at Firing Point	En True	Deg.) Deg.)	7	13.5	2	2.5	13.5	1	3	9.5	9	-7	6	2	3.5	7.5	1	17.5	3	2.5	15.5	1
Eva	r Firi	E TOTAL	(Deg.)	15	11	14	15	18	77	77	77	1.5	£	77	1.5	15	36	115	13	116	77	18	1.5
HOJ Mode, Evaluation Set No.	Data a	Emax ³	(Deg.)	77	27	77	15.5	91	12.5	শ	77	ដ	13	13	17	16	Ί,	75	12	38	ដ	16	77
	D. Brook	Between True		Ves	Not fired	yes	yes	Not fired	Aes	Ves	yes	yes	Fired 1.0 sec. Before Amax	yes	yes	yes	yes	Sak	Not fired	Ves	Fired 0.5 sec. Before Rmax	Not fired	yes
	Do I want to	of Drift in R		_		ı	J			,		•	,	+	+	+	+	+	+	+	+	+	
,		Cc de 1		8-30R-F2	1-151-AL	3-151-D3	2-15R-C4	10-30R-G5	7-301-D4	7 12 1	1-158-F2	9-30L-F5	6-30R-B3	4-15R-E2	3-15I-D3	2-15R-C4	L.	7-30L-D4	1			9-301-P5	5-15L-F5
		Run No.		۶	ŝ	303	708	305	306	302	300	300	310	311	312	313	377	315	316	217	318	310	320

For data at firing point, values given for true Mmax. For data 2 sec. after firing, values given 2 sec. after true Hmax. Notes:

4.4

For definition of code, refer to text. 5 - The missile is successfully launched. F - an attack failure occurs. I - hm is incomplete. Usefur range of Emax is 0 to 15 degress.

Results of Simulation

γL		Evaluationar	5	ן נ	10	2 14	, va	V.	S	2) [H	U	בן כ	ď	y.	14	U	0] 1 v:	V)	i sa	(1)
-		Remarks		*		*							*	:		Marginally Early Firing	3		:			
	Data 2 Sec. After Firing	HOJ HOJ (Deg.)	1	12	1	. د (د		-	Ci	0.5	2.0	c	2	2	2		-	-	-	9	9.5	2.0
	After	En True Deg.)	٦	10.	7	71	-	-	2	0	J	0	12	2	2	5	-	_	-	9	8	2
	Sec.	Frax HOU (Deg.)	1.	1/2	9.5		1	8	11.5	100	Ħ	2	œ	10	11.5	9.5	o	=	6	7	77	10
. No. 2	Deta 2	Enax True (Deg.)	00	-	00	80	Ħ	80	6	8	6	•	60	100	6	م	8	1	9.5	9	9	8
on Set	int	Frax ER ER HAJ True HÖJ Deg) (Deg.) (Deg.)	6	1,5	0	1.5	1.5	7	7	-	2	7	22	3	5.5	н	1.5	8.5	7	6	7	2
aluati	ing Fo	ER ER True HÖJ (Deg.) (D.g.	0		9	15	2	1	2	7	6	7	15	3	5.5	N	1.5	8.5	٦	6	9	7
e, Ev	t Fir	Finax HOJ Deg)(36	6[1.5	12	1.5	13.5	15	4	4	16	77	77	15.5	ដ	1	91	7	23.5	16	7
HOJ Mode, Evaluation Set No. 2	Data at Firing Foirt	Emax True (Deg.)	13	15	77	21	16	13	ដ	13	ध	17	13	15	17	7	13	12	77	10.5	11	#
	. •	Between True Fmax & Emin	yes	Not fired	Ves	Not fired	уез	yes	yes	yes	Fired 1.0 sec. Before Amax	Yes	Not fired	yes	yes	Fired .25 sec. Before Rmax	yes	ves	yes	yes	yes	yes
		of Drift in R		•		-	•		1	1	1	,	+	+	+	+	+	*	+	+	+	+
	,	Codel	7-301-F5	10-30R-G5	4-1-R-E2	1-151-A4	2-15年-07	3-151-13	7-30L-D4	5-15-55	6-30к-вз	8-30R-E2	1-151-A4	2-15R-04	8-30R-E2	6-30R-B3	5-15L-E5	9-30IF5	3-151-D3	4-13R-E2	10-30R-G5	7-30L-D4
		Run No.	321	322	323	324	325	326	327	328	329	330	331	335	333	334	335	336	337	338	339	340.1

For data at firing point, values given for true Lymax. For data 2 sec. after firing, values given 2 sec. after true Lymax. Notes:

4.3

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Emax is 0 to 15 degrees.

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Results of Simulation

CONFID	entl	AL .		N-			-	_	_	-	-									~	7			
			•	Evaluation	S	S	न	F	Ş	5	ဟ	Ŋ	चि	(Eu	S	is.	S	S	S	S	ĵe,	S	ĵu,	S
	•			Remarks			*	*				,		Could have Fired *		Could have Fired *				. 1	* : : :		Marginally Farly Firing	
			Firing	ER HÖL (Deg.)	1	3	16	ន្ព	_	2	9	7	1	6	2	13	1	6.5	2	1	11.5	1	7	2
			After Firin	ER True Deg.)	1.5	3	15.5	14.5	-	2	7	1.5	3	. 6	1.5	12	1	6.5	~	-	16	1	~	2.5
			ညီမှင လ	Emax HOJ Deg	9.5	10.5	14.5	7	9.5	12	9	11.5	9	듸	11.5	15	9.5	8	9	9	7	7	σ,	5
	ū	Evaluation Set, No., 2	Data 2	Enax True (Deg.)	10	8	11	8	10	11		10	10	21	10	27	10.5	6	6	9	8	8	9.5	80
6.3	mlati	on Set	int	ER ER True HOJ (Deg.)	2	6.5	18	11.5	τ	1.5	7	Ţ	2	13	5.5	1.5	1	22	3.5		13.5	3.5	2.5	7
TABLE 6-3	of Str	luati	Firing Point	En True (Deg.)	2	6.5	17	15	1.	1.5	3.5	1	3	13	5.5	7	7	23	3	0.5	177	3.5	3.5	7
H	Results of Simulation			Fig. Hol. Teg.)	71	1.5	81	12	177	91	<u></u>	15	13.5	17	15.5	81	77	13	ជ	71	2	14.5	ធ	9
	Ree	HOJ Mode,	Data at	Emax True (Deg.)	15	2	16	12,5	14.5	16	77.	14	77.	17.5	15.5	17	16	17	75	15	∄	13	ភ	77
			Ti red	Ret	Ves	yes	Not fired	Not fired	sak	Ves	yes	yes	Fired 1.0 sec. Before Amax	Not fired	SBA	Not fired	yes	yes	se£	yes	Not fired	yes	Fired 0.25 sec Before R _{max}	yes
			Del cuite	of Drift in R	1	1	1	1	•	1	1	1	ı	i	+	4	+	+	+	+	+	+	+	+
				Code	3-151-D3	9-30L-F5	10-30R-G5	1-151-A4	5-15L-F5	8-30R-F2	2-15R-C4	7-30L-D4	6-30R-B3	4-15R-E2	8-308-52	10-30R-G5	3-151-03	4-15R-E2	7-30L-D4	5-15L-F5	1-15L-A4	9-30L-F5	6-30R-B3	2-15R-C4
				Run No.	37.1	342	343	377	34.5		347			350	351	352	353	354	355	356	357	358	359	360

For data at firing point, values given for true Mmax. For data 2 sec. after firing, values given 2.sec. after true Emax. * Notes:

43

For definition of code, refer to text. S. The missile is successfully launched. F. An attack failure occurs. I. - Kun is incomplete. Useful range of Emax is C to 15 degrees.

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Results of Simulation TABLE 6.4

,	(Evaluation ²	52	S	-	S	S	s	S	S	(s.	S	S	S	S	S	S	S	S	ř×.	S	FE-4	
		Remarks			*						*			*.			·		!	*		*	
	Data 2 Sec. After Firing	Ed. (Deg.)	6.5		15.5	2	2	-	1	1	12	,	¥	10		2		2	1	20	2	17	1
-	After	FR True (Deg.)	2		1 0	7	10	-	-	(12	,	7	10	7.7	7	1.5	100	4-	17.5	1	ا د د د د	3
	Sec.	(Deg.)	12	30	9	0	ά	2	a	9 0	1	5	2	7,-	10	70	-	-α	0	12	<u> </u>	10	^
No. 2	Data 2	Emax True (Deg.)	-	٥	, 0	12	4	705	30	۶	15	1	4-		7];	7	1	ά	ľ	ــــــــــــــــــــــــــــــــــــــ	1	2.5
n Set	ht	ER HOJ Deg.)	1	\$ C	2 0	100	3	1		1	7	۲,	1	7	7	7	-	10	100	3 6	7.6	واد	27
uatio	ng Poi	ER True (Deg.)		20	χ 2	3,	۸-	4	2.0	7	,	7	- -	1;	1	2	-	10	7	1	, r	4	8
Eva	Firi	Emax HOJ (Deg.)		77	7	1	1	7	7	1	77	81	7	1	12	1	1;	7	7	7,	<u>.</u> ا	7	<u> </u>
HOJ Mode, Evaluation Set No.	Data at Firing Point	Emax True (Deg.)		=	7	7	9	47		77	76	18	77	16	77	72	95	7	יב	1	77.5	7	77
		Fired Between True Rmax & Rmin		yes	yes	Not fired	yes	yes	yes	yes	yes	Not fired	yes	yes	yes	Ves	yes	yes	yes	yes	Not fired	yes	Not fired
		Polarity of Drift in A		1	•	-	•	1	ı	1	1	1	ı	+	+	+	+	+	+	+	+	+	+
,		Code		10-30R-G5	4-158-62	1-15L-A4	2-15R-C4	5-15L-F5	8-30R-E2	6-30R-B3	3-15L-D3	9-30L-F5	7-30L-D4	3-15L-D3	9-30L-F5	4-15B-E2	2-15R-C4	5-15I-F5	8-30R-E2	6-30h-B3	10-30R-G5	7-30L-D4	1-15L-A4
		Run No.	,	361	362	363	364	365	366	367	368	369	370	12.5	372	33	37/2	375	376	377	378	379	380

For data at firing point, values given for true Amax. For data 2 sec. after firing, values given 2 sec. after true Amax. * Notes:

For definition of code, refer to text.

S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.
Useful range of Emax is 0 to 15 degrees. 75

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		Evaluation	٥	a (, (3	. 0	נט ב	(A)	v	ט נ) is ₁	U	U	טפ	တ	(E4	O.	ď	S.	[24	Ce.	S
		Remarks		*	*											Culd have				*	Marginally Early Firing	
	Firing	Hol Hol (Deg.)	Ш.	1 /2	9.5	10		~	-	10	2	7	10	10	5	23	5.5	77	3.5	11.5	,	1-1
,	SacAfter	Emax En True (Deg.) Deg.)	2.5	15.	15	1	3.5	2	-	10	3	2	0	0.5	~	11.5	5.5	2	3	16.5	3.5	-1
		Filler HOJ (Deg.)	01	7	2	=	12	10	12	00	ន	0	101	10	9	15	9	6	17	7	6	디
on No. 2	Data 2	Emax Trus (Deg.)	Ш	12	$_{\perp}$	œ	10.5	2	L	1	Si Si	٥	11.5	0	6	75	7	9.5	5.5	6	6.6	ន
TABLE 6.5 Results of Simulation ode, Evaluation Set N	int	Emax En En Hou Hou (Deg.) (Deg.)	0.5	18	17	2	7	1.5	4.5	ı	Ţ	92	Ţ	0.5	1 i	4	6	~	2	13.5	7	3.51
TAHLE 6.5 of Simula	Firing Point	Er True (Deg.)	-	17.5	16	2.2	i i	2	2.7		~	10	I	2.5		킈	6	2	1.5	17	3	4
ults 9, Eva		E. H.O.	77	18	30	15.5	11,	1.5	15.5	13	ដ	3.4	77	7	13.5	17.5	11.5	13	14	12	12.5	15.5
TARLE 6.5 Results of Simulation HOJ Mode, Evaluation Set No. 2	- Data at	Emax True (Deg.)	13	17	21	13.5	16	17	1.5	77	77	7.7	16	7.7	77	17.5	12	1.5	0۲	13	12	15.5
	G	Fired Between True Rmax & Rmin	yes	Not fired	Not fired	yes	768	yes	yes	Ves	Fired 1.0 sec. Before Rmax	yes	ves	Yes	Yes	Not fired	79.5	res	yes	Not fired	Fired .25 sec Before Amax	yes
		folarity of Drift in Å	1	i	1	,	1	I	•	1	1	_	+	+	+	+	+	+	+	+	+	+
·		Codel	7-30L-D4	10-30R-G5	1-151-AL	9-30L-F5	3-15L-D3	2-15R-C4	8-30R-E2	5-151-F5	6-30R-B3	4-15R-E2	2-15R-C4	5-15I-F5	7-30L-D4	9-30L-F5	4-15R-E2	3-151-03	10-30R-G5	1-15i-44	6-30R-B3	8-30R-E2
1		Run No.	381	382	383	386	385	386	387	388	389	380	-391	332	333	394	395	Т	T	398	399	80,4

For data at firing point, values given for true Rmax. For data 2 sec. after firing, values given 2 sec. after true Rmax. × Notes

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Emax is 0 to 15 degrees. 44

TABLE 7

Summary of Results

AOJ Mode, Set No. 1	5-15R-F5 6-30L-B3 7-30R-D4 3-3CL-E2 9-30R-F5 10-3CL-G5 Totals	3 2 8 4 5 36	12 S S T 4 4.	1 6 4 3	6	5	10 10 10 10 10 10 100	0 0	8 2		Total Number Valid Runs = 100 Total Number Successes = 36 Percent Success = 36
	2-15L-C4 3-15R-D3 4-15L-E2	7 2	· ·		7 7	4	10 10		·		R TO
	-15h-A4 2-15L-C4	7	3 2	7 9			10 10				
	Ccde [1-1	Successes	Failures Due to Steering Errors	Ng of Firings Before Irue Amax	No. of Firings After True Rmin	Failure to Fire During Run	Total Runs Made	Successful Second Missile Firings	Fallure of Second Missile Due to Steering Errors	Second Missile Failures Due to Late Firing and Steering Errors	The second consistence and the second distance distance of the second se

TABLE 7.1

Results of Simulation

-
Set No.
Evaluation S
Mode,
AOJ

4	Data for Second	Missile Firing	En R(2)F Enax En Evaluation	(n.r.)	10.0	16.0		12.2	10.0	17.0 F	6.0 F	2.5 2.0 3.5 F	6.5 F	10.0	19.0 F	5.0 9.5 14.0 F	4.0 F	31.0	11.0	30.0	18.0 F
et No. 1	Data for First	Missile Firing	R(1)F Fmax	(Deg.)	5.5 13.5	12.0 32.0	6.5 19.0	6.5 18.0	5.5 12.0	10.0 29.0	10.0 31.0		3.6 6.0	4.5 10.0	11.0 27.5		2.5 0.0	5.8 16.0	5.3 10.5	4.6 1C.0	10.01
luation S	Radin				0 10.5	6.0 > 20.0	0 . 9.5	C*TI 0*9	0.6 0.9	4.0 18.C	7.5 4.0		8.0 6.0	0.01 0.9	-		0 3.5	8.0 8.5	6.0 11.0	7.0 10.0	4.0 14.5
AOJ Mode, Evaluation Set No. 1	Data at Emin		Rmin Emax	(Deg.) (n.m.)(Deg.)(Deg.)	3.8: 7.0	2.7 6.	3.9 8.		3.8 6.	3.0 4.	4.0 7.		4.1 8.	3.8 6.	None		0°9 0°7	L			3.0 4.
AO.	Data at Rmax4	- ,			7.5	14.5	12.0	12.2	10.0	34.5	4.5	,,,,	1.0	0.6	15.5		2.0	0.1	12.0	10.0	14.5
	Data a	. "	A Par	(Deg.)	19	16	19	118	18	16	1.1		17	18	11		27	18	17	16	15
		Missile Fired	Between Rmax & Rmin		yes	Firsd 10.0 sec. Before Rmax	368	yes	yes	Fired 6.5 sec. Before Rmax	Fired 5.0 sec.	Fired 2.0 sec.	Fired O.5 sec. After Rain	yes	Fired 9.0 sec. Before Rmax	sev	Fired 2.5 sec.	yes	yes	yes	Fired 5.0 sec.
		.,	Code		8-30L-E2	1-15R-±	3-15R-D3	2-151-2	405 110+30L-G5	7-30R-D4	407a 5-15R-F5	5-15R-F5	4-15L-E2	9-30R-F5	410a 6-30L-B3	410b 6-30ï-B3	4-151-82	3-15R-D3	2-15L-C4	8-30L-E2	7-30R-D4
-			i Š		107	707	703	707	105	904	407a	407b	807	601	410a	40L4	777	412	413	777	415

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Notes: 1.

3. Useful range of Equax is 0 to 15 degrees. 4. Rmax Range = 6.5 n.m.

TABLE 7.2

Results of Jimulation

VL.	1		NG T		Ti.	Т	T	7	-	7	Τ	1	T		1	T	T	7	!	7
-			Evaluation	-	E	ď	j je,	t	124	0	(1	[24	G.	(St.)	[24	v.	S	64	[24	တ
	Data for Second	Missile Firing	R(2)F Frax FR	(n.m.) (Deg. (Deg.)				0 2 2 2 0 2 2	Note: Co.											
	irst	ring	뮸	(Deg.)	15.0	10.0	19.5		7.5	4.5	10.0	0.6	-	14.5	12.0	8.0	11.0	2.0	15.0	11.0
6-4	Data for First	Missile Firing	Finax	(Deg.)	14.5	+			0.9	5-0-10-0	0	8	1	17.0	27.0	16.0	11.5	2.0	8.0 16.0	4.8 12.0
AOJ Mode, Evaluation Set No. 1	Data	MI St	R(1)F		6.2	0.9	12.0		3.5	5.0	201	7.5	ı	7.2	10.0	6.1	5.5	2.8	8,0	8•17
ation	nin		Hag.	(n.m.)(Deg.)(Deg.)	19.0				8.0	6.0	٠,	,	0.2		10.0	0.9	12.0	3.0	l	11.5
Evalt	a at R _{min}		True	(Deg.)	li	7.0			7.0	6.0			7.0		5.0	7.5	_		,	7.0
J. Mode	Data	-			2.6	3.8	None	_	3.8	q 1	3.8	3.8	4.1	2.6	3.7	3,9	3.0	0*7	None	3.8
AO.	Data at R _{max} ⁴	٬	# E	(Deg.)	15.0	10.5	15.5		0.6	6.5	8.5	10.0	3.0	14.0	10.5	0.6	12.0	9•0	15.0	8.0
	Data a		True	(Deg.)	16.0	17.0	10.5		18.0	16.5	18.0	18.0	17.0	15.0	17.0	18.0	14.5	16.5	0,11	19.0
	energy ref	Missile Fired	Between Rmax & Emin		yes	yes	418a 6-30L-B3 Fired 9.5 sec. Before Rmax	Ves	Fired 0.5 sec. After Amin	Yes	Sen	yes	Not fired	1-15R-A4 Fired 1.0 sec. Before Emax	Fired 3.5 sec. Before Rmax	yes	yes	Fired 2.0 sec. After R _{min}	Firsd 2.5 sec. Before Rmax	yes
			Code t		1-15R-A4	47.7 no-30L-G5	6-30L-B3	6-30L-B3	9-30R-F5	5-15R-F5	9-20B-E5	10-30L-G5	4-15L-E2	1-15R-	2-15L-C4	3-15R-D3		5-15R-F5	6-30L-B3	430 8-30L-E2
ĺ		Ġ	No.		917	4.7	418a	d817	419	750		1,22	423	424	425	756	1.27	173	429	430

Notes: 1. For definition of code, refer to text. 3. U. 2. S - The missile is successfully launched. 4. R. F - An attack failure occurs.
I - Run is incompate.

3. Useful range of Emax is 0 to 15 degrees.

Regults of Simulation TABLE 7.3

ired n min min sec. sec. sec. n sec. n sec. ax sec. n sec. n sec. n sec.		- (-	AQ	AOJ Mode,	Evaluation Set No.	clon S	et No.	7						
True Emax Eq. Final				Data at	Rmax	Data	at Rm	튑	Data Misej	for Fi	ret	Data Wiss	for Section of First	puo	
Sec. (Deg.) (De	Code	,	Missile Fired Between	Enax True	F. Part	Rain	Frue		F(1)F	Falls.	g g	R(2)F	, and	PH :	Evaluation 2
Sec. 15.5 14.6 2.6 4.0 >20.0 7.0 17.0 14.0 9.5 18.0 10.0 3.8 6.0 11.0 4.2 8.0 10.5 15.5 None - - 10.0 24.0 10.0 14.0 5.0 10.0 14.0 5.0 10.0 14.0 5.0 14.0 4.0			wax « min	(Deg.)	(Deg.)	(nome)		$\overline{}$			(Deg.)	(n.m.)	(Deg (Deg.	
38.0 10.0 3.7 6.0 8.5 5.5 12.0 9.5 38.0 3.8 6.0 11.0 4.2 8.0 10.5 10.0 14.0 2x 10.5 3.8 6.0 11.0 4.0 24.0 10.0 14.0 2x 10.5 4.0 4.0 4.1 7.0 4.0 10.0 14.0 2x 6.0 4.0 6.0 4.0 4.1 7.0 4.0 9.0 3ec. 18.0 9.5 3.9 7.0 8.0 3.0 4.5 8.0 9.0 14.5 7.0 14.5 7.0 14.5 7.0 14.5 7.0 14.5 7.0 14.5 14.0 14.5 14.0 14.5 14.0 14.5 14.0 14.5 14.0 14.0 14.5 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0	1-15R-A4		11. Q	15.5	J.4.6C	2.6	0*7	>20.0	7.0	17.0	14.0				ie,
Fired 6.5 sec. 10.5 15.5 None - 10.0 24.0 19.0 19.0 10.5 Before Runex	2-15I-C4	3	yes	18.0	0.01	3.7	0.9	8.5		12.0	9.5				S
Sec. 10.5 15.5 None - - 10.0 24.0 19.0 19.0 14.0 2.6 3.6 4.0 4.0 4.1 7.0 4.0 5.0 10.0 14.0 3.6 4.0 4.0 4.1 7.0 4.0 4.0 4.1 7.0 4.0 4.0 4.1 7.0 4.0 4.0 4.1 7.0 4.0<	8-30I	至2	yes	18.5	0.6	3.8	0.9	11.0		8.0	10.5				Ŀ
16.5 6.0 4.0 4.1 7.0 4.0	6-30I	33	Fired 6.5 sec. Before Rms r	10.5	15.5	None	1	ì		24.0	19.0		·		ĵŁ,
Fired 1-5 sec. 18.0 9.5 3.9 7.0 8.0 4.0 4.1 7.0 4.0 Fired 1-5 sec. 18.0 9.5 3.9 7.0 8.0 3.0 4.5 8.0 Fired 1-5 sec. 18.0 9.5 3.9 7.0 8.0 3.0 4.5 8.0 Fired 1-7 sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 14.5 Before Runx yes Fired 2.0 sec. 17.0 5.0 3.8 6.0 4.0 2.6 2.0 4.0 Fired 1.25 sec. 15.0 15.0 None - 7.2 17.0 15.0 Before Runx After Ruin Fired 1.25 sec. 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	131b 6-301-B3	E	ves									5.0	0.01	0.7	[z,
Fired 1.5 sec. 18.0 9.5 3.9 7.0 8.0 3.0 4.5 8.0 8.0 Atter Rmin Not fired 2.0 sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 7.0 8.0 3.0 4.5 18.0 14.5 Efred 1.7 sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 14.5 7.0 Before Rmax yes 18.0 9.0 3.8 6.0 9.5 4.1 9.0 10.0 Fired 2.0 sec. 17.0 5.0 3.8 6.0 9.5 4.1 9.0 10.0 Fired 2.0 sec. 17.0 5.0 3.8 6.0 9.5 4.1 9.0 10.0 Efred 1.25 sec. 15.0 15.0 None - 77.2 17.0 15.0 15.0 Atter Rmin 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	1.0	15		16.5	0.9	0.7	0.9	0.7	4.1		0.4		-		S
Fired 1.5 sec. 18.0 9.5 3.9 7.0 8.0 3.0 4.5 8.0 After Rmin Not fired 17.0 4.5 4.1 6. 1.0 - - - res 17.0 7.0 3.8 6.0 5.0 5.3 13.5 7.0 Fired 1.75 sec. 14.0 3.0 4.0 14.5 7.6 18.0 9.0 3.9 4.0 14.5 7.6 18.0 9.0 3.8 6.0 9.5 4.1 9.0 10.0 9.0 After Rmin 17.0 5.0 3.8 6.0 4.0 2.6 2.0 4.0 4.0 Before Rmin 15.0 15.0 15.0 15.0 4.0 7.2 17.0 15.0 4.0 <t< td=""><td>9-30E</td><td>3</td><td></td><td>17.0</td><td>8.0</td><td>3.8</td><td>0.9</td><td>10.0</td><td>4.7</td><td>10.0</td><td>9.5</td><td></td><td></td><td></td><td>တ</td></t<>	9-30E	3		17.0	8.0	3.8	0.9	10.0	4.7	10.0	9.5				တ
Not fired 17.0 4.5 4.1 6. 1.0 Fired 1.75 sec. 14.0 7.0 3.8 6.0 5.0 5.3 13.5 7.0 Before 3max 18.0 9.0 3.9 7.5 8.5 4.8 12.0 9.0 Yes	3-15R-03		Fired 1.5 After R _{mi}	18.0	5.6	3.9	7.0	8.0	3.0	4.5	8•0				ſz.,
Fired 1.75 sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 14.5 7.0 Sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 14.5 7.6 18.0 14.5 Sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 14.5 Sec. 18.0 9.0 3.8 6.0 9.5 4.1 9.0 10.0 Sec. 17.0 5.0 3.8 6.0 9.5 4.1 9.0 10.0 Sec. 17.0 5.0 3.8 6.0 4.0 2.6 2.0 4.0 Sec. 15.0 15.0 None - 7.2 17.0 15.0 15.0 Sec. 15.0 15.0 4.0 7.0 4.0 1.8 2.0 4.0 15.0 Sec. 15.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	ノー・ロード	£	Not fired	17.0	4.5	4.1	9	1.0	ı	l	ı				ſz,
Fired 1.75 sec. 14.0 14.0 3.0 4.0 14.5 7.6 18.0 14.5	4.39 10-301-G5	S	res	17.0	7.0	3.8	6.0	5.0	5.3	13.5	7.0				တ
yes 18.0 9.0 3.9 7.5 8.5 4.8 12.0 9.0 Yes 18.0 9.0 3.8 6.0 9.5 4.1 9.0 10.0 Fired 2.0 sec. 17.0 5.0 3.8 6.0 4.0 2.6 2.0 4.0 After Rain Before Rain 15.0 None - - 7.2 17.0 15.0 After Rain 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	7-30R-D4	4	! વ	14.0	0*71	3.0	4.0	14.5		18.0	14.5				ſ24
yes 18.0 9.0 3.8 6.0 9.5 4.1 9.0 10.0 Fired 2.0 sec. 17.0 5.0 3.8 6.0 4.0 2.6 2.0 4.0 After Rmin 15.0 15.0 None - 7.2 17.0 15.0 After Rmin 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	3-15R-D3	1	ves	18.0	0.6	3.9	7.5	8.5	8.4	12.0	0.6				S
Fired 2.0 sec. 17.0 5.0 3.8 6.0 4.0 2.6 2.0 4.0 4.0 4.0 Eter Ruin Fired 1.25 sec. 15.0 15.0 None - 7.2 17.0 15.0 15.0 Eter Ruin 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	9-30E-F5	完	yes	18.0	0.6	3.8	0*9	9.5	4.1	9.0	10.0				E.
Fired 1.25 sec. 15.0 15.0 None 7.2 17.0 15.0 Efore R _{max} Fired 3.5 sec. 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	10-301-65		Fired 2.0 sec.	17.0	5.0	3.8	0•9	0.4	2.6	2.0	0•4				Œ,
Fired 3.5 sec. 16.0 5.0 4.0 7.0 4.0 1.8 2.0 4.0	1-15R-A4		Fired 1.25 sec. Before Rmax	15.0	15.0	None	1		7.2	17.0	15.0				[24
	5-15R-F5	F.5	. بـــ	16.0	5.0	0•17	7.0	0.4	1.8	2.0	0.4				<u>(s.,</u>

નં તં Notes:

^{3.} Useful range of E_{max} is 0 to 15 degrees. 4. R_{max} Range = 6.5. $n_{om.}$

For delimition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete.

TABLE 7.4

Results of Simulation

			Evaluation	,	1		fe ₄	ft, ft,	£4 £4 £4	fte fte fee fee	£4 £4 £4 £4	E- E- (- 1- 1- 1- 0)	E-1 E-1 E-1 E-1 CO E-1	E- E- E- E- E- C) E- C)	E-1 E-1 E-1 E-1 CO E-1 CO E-1	E- E- E- E- E- O- E- O	E- E- E- E- E- E- O- E- O- E-	E- E- E- E- E- O- E- O- E- O	E	E-1 (-1 (-1 (-1 (-1 (-1 (-1 (-1 (-1 (-1 (נבין נבין נבין נבין נבין נבין נבין נבין
	Second	Firing	Finax Fina	(Deg.)(Deg.)						4.0 11.0	0-11-0	4.0 11.0	4.0 11.0	4.0 111.0	4.0 11.0	0-11-0	0-11-0	4.0 11.0	0.11.0	0.11.0	4.0 11.0
	Data for Second	Missile Firing	R(2)F =	(п.п.)							2.5										
			표		•	12.0	17.0		14.0	0.71	0.41	14.0	14.0	14.0	10.0	114.0 7.0 7.5 7.5	11.0 11.0 11.0 2.0	11.0 11.0 11.0 2.0 2.0	114.0 110.0 11.0 2.0 12.0	14.0 11.0 11.0 2.0 2.0 10.0	
	Data for Second	Missile Firing	X		8	23.0	26.0		+	10.0	 	╁┿╅╅	╁╌┼╌╂╌╂┈╂┈	╁┾╁╌╂╌╂╌	╎ ┊┤╌┨┈┨╌╏╌	╁╌┼╌╂╌╂╌╂╌╂	╁┈╾╃╌╂╼╂╌╅╼┼╼┈╌┼╌╌╌╌	╂╌╤╌╃╌╂┈╉╌╂╼┼╾┉╌┼╼	╂┈═╃╼╂┉╂┈╂╼╌╾┼═╌═╌┼╼╌╌╾	╂╍╤╃╌╉┉╂┈┠╼┼╼┈╾╃═╁╼╼╌╄╼╌╼╼┼┷╼╌	╂┯═╃╌╉╼╂╼╂╼┯═╇═
t No. 1	Data	M. ssi			-	7.3	8.7		6.3		1				والمراجع والم والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراج	المراجع والمساور والبراجة والمراجع والم	والمستوي والمستوي والمنازي والمناز والمناز والمارا	والمراجع والم والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراج	منصوب والمستوان والمستوال المانون والمانون والما	فتستنب والمراجع والم	
AOJ Mode, Evaluation Set No.	Rmin			(Deg.)	16.0	0.6	>20.0		ı	1	5.0	5.0	5.0	5.0 14.5 7.0	14.5 10.0 10.0 5.0	5.0 14.5 7.0 10.0 5.0	5.0 14.5 10.0 5.0 10.0	5.0 10.0 10.0 10.0 2.5	- 14.5 10.0 10.0 10.0 10.0	5.0 14.5 7.0 10.0 2.5 15.0	5.0 10.0 10.0 15.0 10.0
Evalue	at		Emax True	(nom.)(Deg.)	7.0		0.4		Ľ		7.	200	299		00000						
Mode.	Data				3.75	3.7	3.0		None	None	None	None 4.4.7	None 44-1		<u> </u>						
¥O.	t Rmax			(Deg.)	10.0	10.5	17.0		14.0	0•1	3.0	14.0 3.0 10.0	14.0 10.0 10.0 2.0	3.0 10.0 11.5	14.0 3.0 10.0 11.5 2.0	14.0 10.0 10.0 11.5 11.5	14.0 10.0 10.0 11.5 11.5 2.0 2.5	14.0 10.0 10.0 11.5 2.0 11.5 2.5	14.0 10.0 10.0 11.5 11.5 11.5 13.0 8.0	14.0 10.0 10.0 10.0 11.5 11.5 13.0 14.0	14.0 10.0 10.0 10.0 11.5 2.5 11.5 2.5 13.0 8.0
	Data at	,	True	(Deg.)	18.0	17.0	15.0		10.0	10.0	10.0	10.0 16.5 18.0	10.0 16.5 18.0 16.0								
		Missile Fired		TIES & YELL	Not fired	Fired 1.5 sec.	448 7-30R-D4 Fired 5.5 sec.	Teller o totor	Yes	yes yes	yes yes Not fired	Yes Yes Not fired Yes	Yes Not fired Yes Yes	Yes Not fired Yes Yes Yes	449a 6-301-B3 res 449b 6-301-B3 res 450 4-151-E2 Not fired 451 8-301-E2 res 452 10-301-G5 res 453 3-15E-D3 res 454 4-151-E2 Fired 2.25 sec.	Not fired Yes	6-301-B3 res 6-301-B3 res 4-151-E2 Not fired 8-301-E2 res 10-301-G5 res 1-151-E2 Fired 2.25 sec. 7-30R-D4 res 5-15R-F5 After Rmin 7-30R-D4 res 7-40R-B4 res	Not fired Yes Yes Yes Yes Yes Yes Yes Y	449a 6-301-B3 yes 449b 6-301-B3 yes 440b 6-301-B2 yes 451 4-151-E2 Not fired 451 8-301-E2 yes 452 10-301-E2 yes 454 4-151-E2 After Rmin 455 7-30R-D4 Fired 3.5 sec. 456 5-15R-F5 After Rmin 457 1-15R-A4 Yes 458 9-30R-F5 Fired 0.25 sec. 458 Page 1.5	449a 6-30L-B3 Yes 449b 6-30L-B3 Yes 440b 6-30L-B2 Yes 451 8-30L-E2 Yes 452 10-30L-E2 Yes 453 3-15R-D3 Yes 454 4-15L-E2 After Rmin 455 7-30R-D4 Yes 456 5-15R-F5 Fired 3.5 sec. 457 1-15R-A4 Yes 458 9-30R-F5 After Rmin 459a 6-30L-B3 Fired 1.0 sec. 459a 6-30L-B3 Fired 1.0 sec.	Not fired yes
		•	Codel		46 8-30L-E2	447 2=151-C4 Fired 1.5	7-30R-D4		449a 6-301-B3	449a 6-301-B3	6-30L-B3 6-30L-B3 4-15L-E2	6-301-B3 6-301-B3 4-151-E2 8-301-E2	449a 6-301-B3 449b 6-301-B3 50 4-151-B2 51 8-301-B2 52 10-301-65	6-301-B3 6-301-B3 4-151-E2 8-301-E2 10-301-G5	6-301-83 6-301-83 6-301-83 6-301-83 6-301-83 10-301-63 3-158-83 3-158-83	449a 6-301-B3 449b 6-301-B3 450 4-151-E2 451 8-301-E2 452 10-301-G5 454 4-151-E2 455 7-308-D4	6-301-83 4-151-82 10-301-83 10-301-65 3-151-82 4-151-82 7-301-91 7-301-91	44,9a 6-301-B3 44,9b 6-301-B3 450 4-151-E2 451 8-301-E2 452 10-301-G5 453 3-15R-D3 454 4-151-E2 455 7-30R-D4 456 5-15R-F5	6-301-83 4-151-82 8-301-83 10-301-62 3-151-82 4-151-82 7-301-104 5-151-72 9-301-75	6-301-83 4-151-82 10-301-83 10-301-62 1-151-82 1-151-82 7-301-83 1-151-82 7-301-83 1-151-82 6-301-83	449a 6-301-B3 449b 6-301-B3 450 4-151-E2 451 8-301-E2 452 10-301-G5 453 3-15R-D3 454 4-151-E2 455 7-30R-D4 456 5-15R-F5 458 9-30R-F5 459 6-301-B3 459 6-301-B3
		1	Run No.		777	277	8177		449a	46771	65 63 63	22 P P P P P P P P P P P P P P P P P P	44.93 44.93 45.51 45.51 45.51	552 E53	449a 449a 451 451 451 451 451 451 451 451	44.98 44.98 44.98 45.52 45.53	44.9a 44.9a 45.0 45.1 45.2 45.2 45.2 45.2 45.2 45.2 45.2 45.2	449a 449a 4450 451 451 454 455 455 455 457	449a 449a 4450 451 451 451 457 457 457	449a 449a 4450 451 451 451 454 457 456 456 457 459 459	449a 4450 450 450 454 454 454 456 456 456 457 457 459 459 459 459 459

Useful range of Emax is 0 to 15 degrees.

Rmax Range = 6.5 n.m. £ 4

-i &

Notes:

For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete.

TABLE 7.5

Results of Simulation

		~~	Evaluation	:	Ţ£,	S	<u>Fr</u> ,	S	<u>F-1</u>	S		ŝ.	S	Œ.	ĵŝ.	į,	De ₄	တ	(34
	puos	gri	Basx En	· San															
	or Se	0 F1F	True	(Sank (San)				'						ļ					
	Data for Second	Missile Firing		(110He)															
	at	22	True	(·San)	7.0	5.0	13.0	0.6	1.0	11.0	13.5	22.0	0.6	11.5	6.5	0.6	•	9.5	3.5
٦	Data for First	masile riring	Emax True	(10gg-)	0.9	7.5	12.5	0.6		16.5	0.6	10.0	12.0	10.0	5.5	8.5	*	15.0	0.0
st No.	Data	m 351	R(1)F (nome)		3.8	4.5	1.9	4.9	1.2	6.2	5.8	4.5	4.8	5.6	3.5	4.3	ŧ	6.1	7.02
tion Se	in				7.0	0.9	0.05<	8.0	2.0	17.0	*	12.0	8.0	16.0	7.0	0.6	3.0	0.6	4.0
Evalua	Data at R _{min}		True Deg.)		6.0	0-7	1.5	5.5	0.9	0.8	•	0.9	0.9	3.0	6.5	0.9	0.9	0*9	6.5
AOJ Mode, Evaluation Set No.	Data		Rmin Fnax RR True (n.m.) (Deg.) (Deg.)		3.8	4.1	2.6	3.7	0.4	3.8	None	3.9	3.8	3.0	3.9	3.8	4.1	3.7	0*4
AOJ	Data at Rmax ⁴		True Deg.)		4.5	6.0	13.0	10.0	3.0	10.5	14.5	1.5	0.6	12.5	10.0	7.0	0.4	10.01	0-7
	Data at	C	True (Deg.)		16.0	16.0	34.5	17.0	16.0	18.0	10.0	17.0	17.0	0.11	17.0	17.0	16.0	17.0	16.0
		Missile Fired	Between Rmax & Rmin		yes	ves		yes	465 5-15R-F5 Fired 4.0 sec.	Yes				yes	3-15R-D3 Fired 0.75 sec. After Rain	yes	Ν̈́	yes	475 5-15R-F; Pired 2.5 sec.
		r	Code		10-30L-CS	4-151-E2	1-15B-A4	2-151-04	5-15R-F5	8-301-52	6-30L-B3	3-15R-D3	9-30R-F5	7-30R-D4	3-15R-D3	9-30R-F5	4-151-82	474 2-151-C4	5-15R-F5
		-	No.		19	1.62	163	197	597	997	1.67	897	6947	7,00	t7.	725	7.73	727	475

For definition of code, refer to text. S - The missile is successfully launched. F.- An attack failure occurs. I - Run is incomplete. Notes: 1.

3. Useful range of Emax is 0 to 15 degrees. 4. Rmax dange = 6.5 n.m.

TABLE 7.6 Results of Simulation

,		۲	1 6	Paren.	:	- 			i	1	l :			 -	ī	+-	<u> </u>	
		· · · · · · · · · · · · · · · · · · ·	Evaluation			2 (2.	i i	i	[±,	Çæ.	(24	(E.	j J	; ; ;	[24	ט) (b.,	
	buog	o	Frax	(Deg.)			74.0			6.5 11.0					i :	-	i i	
	Data for Second Missile Firing		Fax	(Deg) (Deg)			0 71 0 0			6.5	1			:	:	!		1
	Data 1 Wissi		R(2)F	(J.m.)			7	•	1	0.7					: : :		:	
	irst ring	,	ra [(Deg.)	ν.	17.0		8.0	15.0		18.0	16.0	0.9	14.0	10.0	11.0	11.5	10-0
	Data for First Missile Firing		F. Bax	(peg.)	5.5 71.0	7.2 18.0		3.0	24.0		20.00	21.0	5.9 14.0	16.0	18.0	13.0	18.0	16.5
AUt Mode, Evaluation Sat No. 1	Data Miss		R(1)F	(nome.) (Deg.)	7,	7.2		3.0	4.8		8.5	8.0	5.9	6.1	6.2	5.5	6.8	6.2
son Sa	ជា		チ	(n.m.) (Deg.) (Deg.)	13.0			7.5	12.0		1	18.5	9.5	4.0 >20.0	14.0	10.0	9.5	17.5
va uat	Data at R _{mi} n		True	(Deg.)	7.0	,		0.9	0.4	:	1	0.4	0.9	0.4	0.9	7.0	5.0	0.9
Mode, E	İ		niin ((neme)	3.8	None		3.8	3.0		None	3.0	3.8	2.6	3.8	3.9	3.7	3.8
AUC	Data at Rmax	ŗ.	F.E.	(Deg.) (Deg.)	5.5	16.5		5.0	12.5		17.0	15.0	5.0	14.0	10.5	12.0	11.0	0.6
	Data a	4	True	(Deg.)	18.0	0°TI		16.0	14.0		15.0	14.0	16.0	14.0	16.0	17.0	15.5	18.0
	Magile Fined	Doll's arrection	Ruax & Rmin		yes	477a 6-30L-B3 Fired 3.5 sec.	yes yes	478 10-30L-G5 Fired 1.25 sec. 16	Fired 4.0 sec. Before Rmax	yes	1-15R-44 Fired 4.0 sec. Before Rmax	7-30R-D4 Fired 5.0 sec.	6.0	1-15R-A4 Fired 1.0 sec. Before Rmsx	Fired O.5 sec. Before Rmex	SeV	2-15L-C4 Fired 0.5 sec. Before Rmax	yes
		7000	900		8-301-E2	6-30L-B3	6-201-B3	10-30L-G5	7-30R-D4	7-30R-D4	1-15R-A4	7-30R-D4	482 10-201-65	1-15R-A4	9-30R-F5	3-15R-D3	2-151-64	8-30L-E2
		Run	No.		776	477a	477b	8/4	479a	q62.7	087	187	53	483	787	485	984,	181

Notes: 1. For definition of code, refer to text.
2. 5 - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.

Use ful range of Emax is 0 to 15 degrees. R_{max} Range = 6.5 n.m.

TABLE 7.7

Results of Simulation

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Set
Evaluation
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Q

e			Data at Rmax4	. Rmax4		Data at R _{min}	ún	Data	Data for First	irst	Data	Data for Second	Ę	
-	-	Missile Fired	٠					FIL58	mssile firing	Ting	Ft. SST.	Assile Firing	PO .	
2	Code	Between Rmax & Rmin	Emax True (Deg.)	En True (Deg.)	Rain (nem.)	Frue True (Deg.)	Parigo Trugo (Dego)	R(1)F (nome)	Emax True (Peg.)	Frue True (Deg.)	R(2)F (n.m.)	Enax ER True True (Deg. (Deg.		valuation
887	5-15R-F5	Fired 3.25 sec.	16.0	4.0	0.4	7.0	3.5	1.8	0.0	3.0				4
T 68 th	6-30L-B3	Fired 9.25 sec. Before R _{max}	10.0	15.0	None	•		9.6	28.0	20.0				24
q68†		уез								!	5.3	10.0 13.0	0.0	194
064	4-151-E2	yes	16.0	2.5	4.1	6.0	7.5	5.2	0.11	5.0			 	S
164	2-151-04	Fired 2.8 sec. Before Rmax	17.0	13.0	3.7	5.0	, , ,	0.6	24.0	13.5			i,	[24
1492	5-15R-P5	ye	16.0	5.5	0.4	0.9	5.0	5.2	10.5	5.5			 	S
#6.64		Fired 5.0 sec. Before Emax	15.0	13.5	3.0	3.0	13.0	8.6	24.0	16.5				1
493b	7-30R-D4	!!									3.9	6.01	12.0	C2.
767		yes	ુ•	10.5	3.8	0.9	10.5	5.9	16.0	10.5				S
465	4-151-72	Fired 1.0 sec. After Rain	16.0	3.0	1,01	6.5	5.0	3.5	0*7	0*9				Ŀ
967	3-15R-D3		18.0	10.01	3.9	0.9	7.5	707	9.0	8.0				S
164	10-301-65	yes	0.91	0.9	3.8	5.5	4.5	4.4	8.0	5.0		_	Ť	S
867	1-15R-A4	yes	14.5	14.5	2.6	0.4	0.00	5.6	12.0	14.5		-		[24
7664	499e (-301-B3	Fired Befor	10.5	15.5	None	ì	-	8.0	30.0	17.5				Œ,
4996	6-3CI-B3	. 1	·								hot	8.0 13.5	3.5	-
8	8-30I-32	yas	18.0	6.5	3.8	7.0	13.5	5.5	C-471	8.0			-	מז

For definition of code, refer to text.
5 - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete. 5.5 Notes:

^{3.} Useful range of Emax is C to 15 degreess. 4. Amax Range = 6.5 n.m.

Summary of Results

ł					AOJ Mode	AOJ Mode, Set No.	2					
8	Code	1-15L-A4	1-151-A4 2-15R-C4 3-15L-D3 4-15R-32	3-151-03	4-15R-32	5-15L-F5	6-30R-B3	7-301-04	8-30R-E2	9-30L-F5	5-15L-F5 6-30R-B3 17-30L-B4 8-30R-B2 9-30L-F5 110-30E-35	Totals
ű.	Successes	ત	9	80				г	6	7	8	37
FR 및	Failures Due to Lerge Steering Errore	Н	7				٠,	7	H	2		47
žă.	No. of Firings Before True R _{max}	7	3				W	15			r-1	្រា
24	No. of Firings After True Rain			લ્ય	6	10]	9	88
Fa D	Failure to Fire During Run	,		-								
유	Total Runs Made	οτ	20	10.	10	10	10	10	OT.	10	10	100
8 Z	Successful Second Missile Firings	0	0				, C	0			0	
25年28	Failure of Second Missile Due to Steering Errors	3	T				4	5				ET
្សឧឧស	Second Missile Failures Due to Late Firing and Steering Errors							And Alternative Control	The state of the s		Н	
					** * * * * * * * * * * * * * * * * * * *	The second second	The second second	*			•	•

Total Number Valid Runs = 100 Total Number Successes = 37 Normalized Percent Success = 37

TABLE 8.1

Results of Simulation

AOJ Mode, Evaluation Set No. 2

Run Ko

-	·					Ī		-					
	;	Data a	Data at Rmax	Data	Data at R _{edi} n	ц'n	Data	Data for First Missile Firing	irst	Data	Data for Second Missile Firing	cond	
	Missile Fired	1		£					ρ.		}		
Code	Between Rmar & Rmin	A Part	True	n in	No.		R(1)F	X	H. L.	R(2)F	X	e i	Evaluation
				Hot.	(deg)	(deb)	(nome)	(geb)	(deg)	(n.m.)	(deg)	(deg	
8-3CR-E2	yes	18.0	10.5	3.6	9.0	0,11	5.1	12.0	11.5				S
1-151-46		15.0	15.0	None	3	1	6.5	14.5	14.5				S
3-151-03		18.0	11.5	0.4	0.	10.5	6.1	16.0	11.0				တ
2-15R-CL	Fired 6.0 sec. Before Emax	17.5	6.6	3.5	5.0	ļ	6.6	32.0	12.0		,		ís.
2-15R-CU										3.5	5.0	8.0	24
10-30R-G4		16.0	5.5	0.4	0.9	5.5	0.4	0.9	5.5				m
7-30L-D4	Fired 9.25 sec. Before R _{max}	14 5	14.0	3.0	4.0	12.5	7.6	33.0	19.0				βų.
7-30L-D4	yes									6•4	0.6	0.1	į,
5-151-75	Fired 2.75 sec. After R _{min}	16.0	7.0	3.8	7.0	4.5	2.0	0.0	3.0				[54
4-15R-E2	Fired C.75 sec.	16.5	4.5	3.8	7.0	7.0	3.3	5.0	6.5				ĹŦĄ
9-30L-F5		18.0	8.0	0.4	6.0	9.0	4.8	10.5	9.0				ഗ
6-30R-B3		10.5	14.0	Моле	ı	•	7.9	19.0	15.5				(£4
6-30R-B3	уөв									4.9	9.0	13.0	٤.
4-15R-E2	Fired 1.2 sec. After Emin	16.0	1,2	4•1	6.5	4.7	3.3	3.5	6.0				E4
3-151-03	yes	18.5	9.5	4.1	6.5	8.2	6•7	10.0	0.6				ഗ
2-15R-C4	Fired 0.3 sec. Before Rmax	17.0	10,2	3.3	5.0	9.0	6.7	18.0	10.5				Ē
8-30R-E2	yes	18.0	8.0	3.6	6.5	11.6	4.2	10.0	11.5				ſъ
7-301-Du	yes	14.5	12.5	3.4	3,0	14.2	6.5	6.5 14.5	12.5				S

Notes: 1. For definition of code, refer to text.
2. S - The missil is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.

3. Useful range of Emax is 0 to 15 degrees.
4. Rmax Range = 6.5 n.m.

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TABLE 8.2

Results of Simulation

		•	Emax En Evaluation True True		1	, E	ſΞ	[24	Œ	[±4	(Pa)	Œ	[24	ít,	S	Œ	[24	ĈŁ,
	puo:	?	F	(deg)		:											9.5	
	Data for Second		True	(deg)(deg)									٠.				6.5	
	Data Missi		R(2)F	(n.m.)													Q	
	irst	ρ	True	(Sep)	14.0	3.8	12.8	9.4	1.2	5•3	3.7	4•3	16.0	£,11	8.0	14.0		4.2
	Data for First		Frax	(geb)	19.0	1.0	8.5	8	0.4	5•0	2.0	2.0	20.5	18.5	8.5	°.		1.0
AOJ Mode, Fvaluation Set No. 2	Data		R(1.)F	(n.m.)	7.4	2.5	4.1	4.4	1.5	3.5	3.1	2.6	7•4	6.8	4.5	0.6		2.8
tion Se	in		a Li	(deg)	0.05<0.4	4.8	1	9.6	2,1	5.0	7°7	0*5	ı	0°6	7.5	10.3		0•4
valua	Data at Ruin	F	True	(gep)	ŀ	0.9	-	6.5	6.0	6.5	6.0	د.)	-	5.0	7.0	3.0		6.5
Mode, F		,	rimin,	(Bep)(*#*u)	3.1	3.8	None	0.4	4.1	3.9	0.4	3.8	None	3.5	0.4	3.35		4•1
AOJ	Data at Rmax4	F	True		14.3	5.4	0,41	6.7	4•0	0*7	5.0	0.4	15.7	0.11	9.0	12.0		7.0
	Data at	6	True		15.0	16.5	10.0	13.5	16.0	17.0	16.5	16.5	15.0	17.5	17.0	14.5		16.0
		Missile Fired	Between Rmax & Pmin		Fire' 2.8 sac. Before Ruax	Fired 2.1 sec. After Rain	yes	yes	5-151-FF Fired 4.4 sec.	Fired 0.6 sec. After Rain	Fired 1.6 sec. After Rmin	Fired 1.7 sec. After Amin	Fired 4.1 sec. Before Rmax	Fired 0.5 sec. Before Rmex	yes	Fired 4.0 sec. Before Rmax	Yes	Fired 2.0 sec. After Rmin
		•	Code		1-151-44	10-3011-95	€E-30€-9	9-30L-F5	5-151-F5	9-301-55	10-30R-G5	73-35T-4	77-151-T	77-151-C	3-151-03	70F-2	7-30L-D4	
			No.		516	517	518	519	520	521	522	523	524	525	526	527a	527b	528

Notes: 1. For definition of code, refer to text.
2. S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.

3. Useful range of Emax is 0 to 15 degrees. 4. Rmax Range = 6.5 n.m.

TABLE 8.3.

Results of Simulation

		Ċ	Evaluation		Ĕ4	Œ	ഗ	ഥ	Œ,	ß	S	ĹŦ	æ	ĵż,	S	S	(2 ₁	(E4	ſz,	F
	ond	Ī				8.0 12.0			5.5 12.0				9-11 0-6							9.5 12.0
	or Sec	7	True True (deg)			0*8			5.5				0.6							9.5
	Data for Second	TESTI	R(2)F (nome)		·	5.23			4.2				947				-			3.9
	rst	9	F. (deg)		15.5		9.5	14.0		8.0	0.11	18.0		1.6	0.5	83	0.4	2.0	16.6	
	Data for First	277	deg)		0.61		15.0	20.5		17.0	12.5	24.5	i	2.0	0.6	13.5	1.5	0.0	29.5	
AOJ Mode, Evaluation Set No. 2	Data Mara	TEST	H(1,)F True (n.m.)		7.3		5.6	7.7		7.9	5,1	9*6		2.0	404	563	1.5	2.5	10.7	
tion Se	п		En True (deg)		۱.		11.0	13.3		8.0	11,2	-		3.5	9.2	7.0	4-4	2.3	13.8	
valuat	Data at R _{min}		Free (geg)		1.		6.5	5-5		6.0	8.0			7.5	6.5	7.65	7.0	5.5	4.0	
Mode,	Data		Radin Eman True (n.m.) (deg)		None		3.62	2.9		3.6	3.75	Mene		1.4	3.9	0.7	3.8	1.4	3.25	
AOJ	Rmax4		쯗	14.0		0.6	13.3		9.0	9.5	13.2		0.4	6.5	9.4	2,2	2.7	13.0		
	Data at R _{max} 4	۲	Frus		10.5		18.0	15.5		18.0	18.5	0.11		16.5	18.0	18.0	17.0	5•21	16.5	
		Wastle Fired	Between Emax & Emin		Fired 3.8 sec. Before Amax	yes	768	fired 3.5 sec. Before Rmax	7.83	765	yes	Fired 6.8 sec. Before Rms.	yes	Fired 3.2 sec. After Rmin	ves	yes		Fired 2.6 sec. After Emin	Fired 7.1 sec. Before R _{max}	yes
	· ·		Code		529a 6-30R-B3	6-30R-B3	8-30R-E2	531a 1+151-A4	531b 1-151-A4	2-1 5R-C4	8-30R-E2		6-30R-B3		9-20I-F5	3-151-03	4-15R-E2	10-30R-G5	7-30L-D4	54cb 7-30L-D4
			Run No.		529a	529b	530	531a	531b	532	533	5342	4782	535	536	537	538	539	540a	54B

e, 4, For definition of code, refer to text. 5 - The missile is successfully launched. F - An attack failure occurs. I - Run is incommitte. , ç Notes:

Useful range of Emax is 0 to 15 degrees. Rmax Range = 6.5 nome.

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TABLE 8.4

Results of Simulation

				AOJ	Mode	Free	ADJ Mode Francisco	1						
			Data a	Data at Rmax ⁴	Data	Data at Rmin	nin	Data	No. 2 Data for First	irst	Data	Data for Second	- pu	i
Run	Codel	Patrice Fired	E	,	,			Miss	Missile Firing	ring	Missi	Missile Firing		
<u>့</u>		Rmax & Rmin	True	Fr.	rmin (neme)		Emax ER True True (deg)(deg)	R(1)F	Emax True	F. F.	R(2)F	Fnax	2 2	Evaluation ²
54.1	3-151-03	ves	17.5	0	2 7.5	- 11	0,1		(meg)	(deg)	(neme)	(neme) (deg) ((deg.	
51.2		yes	18.0	0	3.07	7	200	T.0	1200	7.57	1		-+	S
543	10-30R-G5	Fired 2.4 sec.	17.0	5.4	4.1		3.3	2.8	0.5	2.0		-	- 	O) E
5440	1-15L-A4	Fired 7.9 sec. Before Rmsy	15.5	13.2	2.6	0.4	19.0	10.2	24.0	14.3				, CE
24/12	1-151-44	yes												•
545	{	Fired 2.9 sec.	16.5	6.5	7.0	7.0	4.5	2,1	1.0	3.0	700	7.66	7.	Eq Eq
915		Xes.	18.5	7.6	3.9	7.5	13.6	6.3	13 5			-	+	
247		Ve3		11.0	3.6	7.0	9.0	3.7	97	0		-	+	S) E
748	7-30L-D4	Before Rmax	14.5	13.5	3.1	3.5	11.5		25.0	16.3		-	+	24 (2
548	!	yes	:		1	-							-	•
549	6-30R-B3	705	10.5	14.5	None	1	,	8.8	0.5	17. 0	4.0.1	7.5 1.1	11.8	Cen (
55	4-151-E2	fired 1.0 sec. After Emin	16.0	2.5	3.9	6.5	5.0	3.2	3.0	200			+	e. Ce
55	8-30R-E2	yes	18.0	0.6	3.8	7.0	12.2	2 2	(,		+	+	•
25	552 10-30R-G5	Fired 2.4 sec.	16.5	6.3	4.2		5.0	0.0	0.0	0 0			+-	87 6
553	3-151-D3	Fired O.6 sec.	17.5	5.4	0.4	7.5	0.6	3.6	5.5	9.2		-	+	, 6
554	4-15R-E2	Fired 2.1 sec.	16.5	2.2	3.8	7.5	3.0	2.2	1.0	27		+-	+	- G
55%	7-301-D4	Fired 4.5 sec. Before Rmax	14.5	13.5	3.3	3.0	13.4	1 -	0.42	15.0			+	ia je
553	7-30L-D4	yes			-		1				- 7	7	+,	, ,
					day and the same		4			-	1	7.71 (.0		<u>.</u>

3. Useful range of Emax is 0 to 15 degrees. 4. Rmax Range = 6.5 n.m. For definition of code, refer to text. S - The missile is successfully launched. F - λ n attack failure occurs. I - Run is incomplete. 4 % Notes:

78

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TABLE 8.5

Results of Similation

		,	Evaluation ²	the state of the s	£4	•	£4	(Z-)	S	S	S	ſ±,	S	É	တ	[24	<u>re</u>	بغر	S	Ŀ
	cond	0	F	(deg)											-+		12.4			_
	Data for Second		True	\sim 11													9.5		_	
	Data	TOO THE	R(2)F	(neme)													5.7			
	rat	9	F. F.	(deg)	2.0	1400	9.3	13.8	0.6	0.4	4.2	13.8	9.5	2.0	2	ပ္ လ		8.0	7.8	14.8
	Data for First	2	Engx True		2.0	0.9	7.5	14.0	10.5	17.0	10.0	17.5	18.0	3.0	15.5	36.0		0•9	14.0	11.5
0.2	Data	TOGTH	R(1)F	(n.m.) (deg)	2.1	3.6	4.2	2•0	5.1	6.5	4.7	7.2	6.5	1.7	5.8	13.0		3.5	5.4	5.5
Evaluation Set No.	in		r. E.L.	(deg)	2,3	•	9.5	1	7.6	2.0	5,2	17.7	0.6	2.6	16.6	1		8.3	9.11	15.2
uation	Data at R _{mi} n		True		6.5	•	7.0		0.9	6.0	6.5	5.0	0*9	7.0	7.5	1		7.5	2.0	5.0
, Eval	Data		Ruin	(п.m.)(deg)	4.1	None	3.9	None	3.75	. 4.2	3.9	2.9	3.75	T•4	3.75	None		3.9	3.9	2.9
ACJ Mode,	at Rmax4		F. S.	3.7	14.4	8•4	13.8	6.0	7.0	1.5	13.7	9.5	7•7	0.6	12.7		10.4	0.9	16.0	
•	Deta a		Finax True		16.0	15.0	17.5	11.0	18.0	17.0	16.0	15.0	18.0	16.5	18.5	10.5		18.0	17.5	15.0
		Me on: 10 Th wood	Between	William S. Xenia	Fired 3.0 sec.	yes	yes	Fired 1.1 sec. Before Rmax	yes	yes	yes	Fired 1.8 sec. Before Rmax	Yes	Fired 3.7 sec. After Rmin	yes	Fired 14.9 sec	ves	Fired 0.7 sec.	ves	yes
			Code		5-15L-F5	1-151-44	9-301-F5	6-30R-B3	2-15R-C4	10-30R-G5	4-15R-E2	78-7 51-1	2-15R-C4	5-151-F5	8-30R-E2	567a 6-30R-B3	5676 6-30R-B3	3-151-D3	9-30L-F5	
			Run No.		355	557	r		385	561	562	593	264	565	566	567a	5675	568	569	

For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete. 4 % Notes:

^{3.} Useful range of Emax is 0 to 15 degrees. 4. Rmax Range = 6.5 new.

TABLE 8.6

Results of Simulation

		,	Evaluation		Ŋ	S	(E4	S	₿ E 4	ഗ	[2.	ře,	ш	Œ	(E)	ĵs.	Œ,	S	S	S
	puoc	30 10	52	(deg.									6.5					1	,	
	or Sec		E E	(deg) (deg					٠				1.5						i	
-	Data for Second	TICCIL	R(2)F	(neme.)									3•0		"					
	rst	2	E j	deg)	11.5	10.0	5.2	7.04	1.5	10.5	13.0	7*0		2.5	14.0	17.5	2.7	13.0	9.5	7.0
!	Data for First	777	Emax	(deg)(deg)	18.0	13.0	0.0	300	1.5	10.5	0.01	28.5		0.6	16.5	13.5	1.0	13.5	15.0	8.0
t No. 2	Data	10071	R(1)F	(neme)	6.5	543	2.1	947	1.75	9•4	0.9	9,5		8.7	6.75	0.9	2.1	6.2	5.7	3.9
tion Se	in		F. F.	(deg)	11.4	7.6	9.6	7.0	3.0	11.7	~	7.6		7.11	3.5 20.0	0.02< 0.4	0.4	16.0	15.0	7.0
Evalua	Data at Rmin		Emax True	(gep)	7.5	li	1	5.5	7.0	7.5	•	6.0		0*7	3.5	0.7	7.5	0.0	8.0	8.0
ACJ Mode, Evaluation Set No.	Data		Rmin	(n.m.)	0.4	3.75	4.1	3.75	4.1	3.9	None	4•1		3.1	2.4	2.9	4.1	2.7	3.9	3.9
AQ	Rmax		True		11.5	8.0	3.0	0.6	3.6	7.0	13.3	8•0		3,1.6	13.7	17.7	3.7	13.4	7.8	10.0
	Data at Rmax		Emax True	-	18.0	17.5	16.5	17.5	16.5	18.0	0	17.0		15.0	16.0	16.0	18.0	15.5	18.0	18.0
		Missile Fired	Between Rmsy & Rmin		TAS	yes	Fired 2.7 sec. After Rmin	ves	Fired 2.0 sec. After Emin	i	yes	578m10-30R-G5 Fired 5.0 sec. Before Fmax	578010-30R-G5 Fired 2.0 sec.	yes	Fire Bef	yes	582 10-30R-65 Fired 3.5 sec.	yes	yes	yes
		(Code		3-15I-D3	9-301-75	4-1.5R-E2	2-15R-C4	5-15L-F5	8-30R-E2	6-30R-B3	10-30R-G5	10-30R-G5	7-3CL-D4	1-151-14	7-30L-D4	10-30R-G5	1-151-44	9-301-F5	3-151-03
		-	No sar	1	577	572	573	27.4	57.5	576	577	578	5780	579	580	581	582	583	584	585

3. Useful range of Emax is 0 to 15 degrees. 4. Rmax Range = 6.5 n.m. For definition of code, refer to text.

S - The missile is successfully launched.

F - Ar attack failure occurs.

I - Run is incomplete. 4 % Notes:

Results of Simulation

			Evaluation ²		S	S	jžų	12.	íz.,	S	ſz,	[1 ₄	S	(Eq.	S	S	£4	(Ec	Çe.	S
	bro	φ	盎	(deg)			,											12.0		
	or Sec		rema.	(deg)	-													8.5		
	Data for Second	776671	R(2)F	(n.m.)											-			4.5		
	rst	9	æ	(geb)	9.7	11.7	2.0	13.4	7.0	8.0	2.2	9.2	6.3	2.7	8.2	2.8	16.3		34.8	6.4
2	Data for First	77.	Emax	(Sep)(Sep)	0.41	14.0	3.0	9.5	3.5	12.0	0.0	8.5	0.6	0.0	11.5	6.5	23.0		0.11	3.9₹
AOJ Mode, Evaluation Set No. 2	Data Missi	TOOTI	R(1)F	(n.m.)	5.6	6.4	1.3	5.9	3*0	5.2	2.6	9•4	4.5	2.5	609	4.2	0.6		6.5	6.1
tion	Ln	1	er j	(geb)	9.7	13.0	2.0		6.3	7.5	2.4	9.6	6.0	3.7	7.5	2.8	1		-	7.0 10.7
Evalu	Data at R _{min}	_	Enex True		7.0	8.0	7.5		7.5	0.9	6.5	3.5	6,0	7.0	7.5	6.5	•		ì	2.0
Mode	Data		Ratin	(n.m.) (deg)	3.79	3.75	4.2	Моле	7.4	3.9	7.7	3.0	3.9	7*7	3.9	4.2	None		None	3.9
AO	Rmax		æ į	}	9.3	10.01	3.5	13.5	7*2	8.6	3.6	12.0	0.5	7*7	7.6	2.8	12,1		14.8	0.6
	Data at R _{max} ⁴		Fills	}	18.5	19.0	17.5	11.0	17.5	18.0	16.5	14.5	18.0	16.5	18.0	17.0	15.5		11.0	18.0
		Missella Fired	Between	umax & umin	Set.	ves	Fired 3.7 sec. After R _{min}	Yes	Fired 1.7 sec. After Rann	yes	Fired 2.4 sec.	ves	yes	Fired 2.7 sec.	yes	yes	Fired 5.9 sec.	Ves	yes	yes
			Code		2-1 FB-C).	8-30R-E2	5-151-F5	6-30R-B3		2-15R-C4	5-151-F5	7-301-DL	9-30L-F5	1	3-151-03	597 10-30R-G5	598a 1-151 A4	5988 1-151-AL	6-30R-B3	8-30R-E.
. {			Pun.		586	26.	588	260	5%	265	592	593	765	595	2965	597	5983	598B	599	Ş

For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete. Notes: 1.

81

Useful range of Emax is 0 to 15 degrees. Amax Range = 6.5 n.m.÷ 4

TABLE 9

Summary of Results

Attack-While-Search Mode Deviated Pursuit, Lead Angle 100 Set No. 1

Code	1-15R-AL	2-151-C4 3-15R-D34-151-E2	3-15R-D3	4-151-E2	5-15R-F9	5-15R-F96-30L-B3	7-30R-D4	8-3CL-E2	9-30R-F5	7-30R-D4 8-3CI_E2 9-30R-F5 10-3CI_G5 Totals	Totals
Successes	α	7	6	6	3		ä	6	9	9	53
Failures Due to Launch Heading Errors	€0	3		1	7	10	€	н	77	7	971
Failures Due to Firing Before F <u>m</u> ax			٦	·				The first case in the control page of the first		·	
Failures Due to Firing After R _{min}						·					
Pailure to Fire When Permissible	·	·	·								
Total Runs Made	10	10	10	10	10	10	10	10	10	10	100
Potential Successes If Fired at Rmax	8	10	10	ot	9	r	-7	10	2	40	839

% Success ≈ 53 % Potential Success = 68

Total No. Valid Runs = 100
Total No. Suc. esses = 53
Total No. Potential
Successes if Fired
st Rmax = 68

82

TABLE 9.1

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, lead Angle 10° Set. No. 1

	Fwelmetion2	3	m)	-	va .	2.	v)	Graf C	2.4	S	S	£4,	S		ιη	(2)	Ξ.,	[24	-	۲.	£.	FE4
	S. como a	en rement		!	1																	
	Point	ER (deg)	8*7	8	8.5	17	10.8	& &	0.41	10.0	10.5	8	6.6	0.7	0.9	8.5	17.7	>20	12.8	2,00	18.2	280
	Firing	Tmax (deg)		8.5	12	검	-	0.8	_		14	6	11	2	72	75	77	2	2	10	14.2	ន
	Data at	RFire (n.m.)	5	5.4	5.0	5.0	5.5	5.0	5.5	5.0	5.9	5.8	5.3	4.5	5.5	5.0	5.5	5.5	5.5	5.4	5.8	5.7
	'n'n	ER (deg)	7.8		12.5	Ŕ	0.6	··6-	14.9	2	15.0		9.7	5.0	6.1	H	19.5		13.9		8	
T *ON 'IAC	Data at R _{min}	Reax (deg)	6.5	,	7.0	20	0.9		6.5	0.9	6.5		7.0	7.0	6.2	8.0	5.5		7.5		0.8	1
è	Date	Rmin (name)	0*47	None	4.1	3.75	407	None	4.1	4.25	4.2	None	3.9	4.1	3.75	0.4	3.5	None	4.10	None	0.4	None
	nax nax	ER (deg)	1.5	8	5.8	12.6	71.7	82	13.5	10.8	8.6	8,	10.5	2.8	0.9	8.0	17.5	>20	12.4	& ^	15.4	28
	Data at Rmax	Emax deg)	16	8.6	15.8	17	15	13	15	15	15.8	10	16	17	17	13	15	10	16	10	16.8	10.1
	Date	Rrex (neme)	6.5	5*9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7.9	6.5	6.5	6.5	7.9	6.5	6.5	6.5	6.5	6.5
٠	Fired	Between Rmax & Rmin	yes	yes	yes	yes	yes	yes	Ves	Yes	ves	Ves	Ves	ves	ves	yes	ves	ves	ves	ves	ves	yes
		Code	8-30I-E2	1-15R-44	3-15R-D3	2-15L-C4	10-301-G5	7-30R-D4	5-15R-F5	(-15I-E2	9-30R-F5	6-30I-B3	1-1 51-E2	<u>;</u>	L.	8-30L-E2	7-30R-D4	1-1 5R-AL	10-301-65	6-301-B3	9-30R-F5	5-15R-F5
	ģ	Ş.	3	603	63	709	605	909	403	200	200	610	617	612	613	179	615	616	617	819	619	620

For definition of code, refer to text.

S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.
Useful range of Fmax is 0 to 15 degrees. ^ب % Notes:

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 10° Set No. 1

| | Evaluation | ဟ | (E. | S | ſz, | ξΩ | ימי

 | 54 | [£,
 | ĵe. | 62) | îe, | الحا | Ø | ĹΨ | ſĸ,
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--	---	---	---	--	---
--	--	---			
	Renarks				

 | |
 | - | | | | | |
 | | | | |
 |
| Point | (Ges) | 9.3 | ×20 | 2.4 | >20 | 10.9 | 1.5

 | >20 | >20
 | >20 | 8.5 | >20 | 24.3 | 13.8 | >£ 0 | >80
 | 16 | 3.8 | 77.9 | 77 | 18.8
 |
| Firing | Emax
(deg. | 7 | 8.6 | 13.5 | 13 | 114 | 1.5

 | 14 | 10
 | 10 | 77 | 30 | O.S | 16 | 3.8 | 9.7
 | 13.8 | Ħ | 11.6 | 14.5 | 12.5
 |
| Data at | RFire (n.m.) | 5.5 | 4.5 | 5.5 | 5.6 | 5.4 | 5.5

 | 5.5 | 4.5
 | 5.7 | 5.4 | 5.5 | Doll | 5.3 | 4.9 | 5.0
 | 504 | 4.07 | 5.0 | 5.6 | 5.6
 |
| ii | 略
(deg) | 14.7 | >20 | 2.0 | | 13.6 | >20

 | 82 | \
\
 | | 16.1 | | 14.7 | >20 | |
 | 16.5 | 10.4 | 13 | 18.7 | 8
 |
| at Bm | | 7.8 | 6,0 | 7.8 | | 6.5 | 8.0

 | 4.0 | 6.5
 | | 0.8 | | 5.8 | 7.0 | |
 | 8.0 | 7.9 | 7.5 | 8.0 | 0.9
 |
| Data | Rain
(n.m.) | 4.1 | 3.9 | 4.1 | None | 3.75 | 7.0

 | 3.1 | 3.9
 | None | 3.9 | None | 5.5 | 3.6 | None | None
 | 3.6 | 0.7 | 4.1 | 3.9 | 3.5
 |
| × | ER
(deg) | 8.0 | 88 | 4.1 | 18 | 11.2 | 12.4

 | 18.9 | >20
 | >20 | 4.4 | | 13 | 1104 | >20 | 8
 | 1.5 | 504 | 11.2 | 13.3 | 18.2
 |
| at Runa | Emax
(deg) | 16.5 | 17.9 | 16.0 | 77 | 18 | 17

 | 16 | 17
 | 111 | 17.5 | | 17.9 | 17.8 | 110.2 | 10.5
 | 7 | 1.7 | 16.5 | 16.2 | 14.2
 |
| Data | Rmax
(n•m•) | 5.9 | 6.5 | 6.5 | 6.5 | 7.9 | 6.5

 | 6.5 | 6.5
 | 6.5 | 4.0 | None | 6.25 | 6.3 | 6.3 | 6.5
 | 7.9 | 7.9 | 6.5 | 6.5 | 6.5
 |
| Fired | Between
Rmax & Rmin | уез | yes | yes | yes | yes | Yes

 | yes | Yes
 | yes | Ves | 00 | yes | yes | ves | yes
 | yes | yes | yes | yes | yes
 |
| - | Code | 9-30R-F5 | 10-30L-G5 | 4-15I-E2 | 1-156-44 | 2-15L-C4 | 3-158-03

 | 7-30R-D4 | 5-15B-F5
 | 6-30L-B3 | 3-30L-E2 | 1-15R-A4 | 2-151-C4 | 8-30I-E2 | 6-301-83 | 5-15B-E5
 | 9-30R-F5 | 3-15R-D3 | 4-151-52 | 10-30L-G5 | 7-30R-D4
 |
| Pin | No. | 1Z9 | 622 | 623 | 624 | 625 | 626

 | 627 | 628
 | 629 | 630 | <u>15</u> | 632 | 633 | 634 | 635
 | 929 | 637 | 869 | 639 | 07/9
 |
| | £: | Ired Data at Ruin Data at Ruin Data at Ruin Data at Firing Point Cween Rmax Emax Emax Emax Emax & Rmin (n.m.*) (deg) (n.m.*) (deg) (deg) (deg) (deg) | Code ¹ Perween Runax & Runin (n.m.a) Emax & Runin (n.m.a) Bata at Runin (n.m.a) Bata at Runin (n.m.a) Bata at Runin (n.m.a) Bata at Runin (n.m.a) Reparks (n.m.a) Remarks | Code ¹ Between Rmax & Rmin (n.m.) Rmax & Rmin (deg) (deg) (deg) (n.m.) Between (deg) (deg) (deg) (deg) (deg) (n.m.) Rmin (deg) (deg) (deg) (deg) (deg) (n.m.) Emax (deg) (deg) (deg) (deg) (n.m.) Remax & Rmin (deg) (deg) (deg) (n.m.) RF1 red (deg) (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (deg) (deg) (n.m.) RF2 red (deg) (deg) (deg) (deg) (deg) (deg) (n.m.) RF2 red (deg) (de | Code ¹ Pired Data at Rmax Data at Rmin Data at Firing Point Remarks Code ¹ Between Rmax & Rmin Rmax & Rmin Rmax & Rpire Emax & Remarks 9-30R-F5 yes 6.5 16.5 8.0 4.1 7.8 14.7 5.5 14 9.3 4-15L-E2 yes 6.5 16.0 4.1 4.1 7.8 2.0 5.5 13.5 2.4 | Code ¹ Fired Data at Emax Data at Emin Data at Firing Point Remarks Code ¹ Between Rmax & Rmin (n.m.) Emax & Rmin (deg) (deg) (n.m.) Emax Emax & Rmin (deg) (deg) (n.m.) Emax (deg) (deg) (n.m.) Emax (deg) (deg) (n.m.) Emax (deg) (deg) (deg) (n.m.) Emax (deg) (deg) (deg) (n.m.) Emax (deg) (deg) (deg) (deg) (deg) (n.m.) Emax (deg) (deg | Code ¹ Fired Data at Rmax Data at Rmin Data at Firing Point Remarks Code ¹ Between Rmax & Rmin Emax & Rmin <td>Code¹ Between Rmax & Rmin Bata at Rmin Data at Firing Point Remarks 9-30R-F5 Funax & Rmin In.m. Ideg) (deg) (n.m.) Ideg) (deg) (n.m.) Ideg) <</td> <td>Code¹ Between Rmax Rmin (n.m.) Bata at Rmin (deg) (deg) (n.m.) Emax Emax (deg) (deg) (n.m.) Bmin (deg) (deg) (n.m.) Emax (deg) (n.m.) Emax (deg) (deg) (n.m.) RFire (deg) (n.m.) Emax (deg) (deg) (n.m.) RFire (deg) (n.m.) Emax (deg) (deg) (n.m.) Remarks 9-30R-F5 yes 6.5 16.5 8.0 4.1 7.8 14.7 5.5 14 9.3 10-30L-G5 yes 6.5 17.9 20 4.1 7.8 2.0 2.0 4.2 1-15R-Mt yes 6.5 14 1.8 None 5.6 13.5 2.4 2-15R-Mt yes 6.4 18 11.2 4.0 8.0 20 5.6 14 10.9 3-15R-D3 yes 6.5 16 18.9 3.1 4.0 2.6 14 10.9 10</td> <td>Code¹ Between Rmax Rmin (n.m.) Emax Rmin (deg) (deg) (n.m.) Emax Bm (n.m.) Emax Rmin (deg) (deg) (n.m.) Emax Bm (n.m.) Emax Rmin (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (deg) (deg) (deg) (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (d</td> <td>Code¹ Between Rmax Rmin (n.m.) Data at Rmin (deg) (deg) (n.m.) Emax Bmax Rmin (n.m.) Emax Bmax Rmin (n.m.) Emax Bmax Rmin (n.m.) Emax Bmax Rmin (n.m.) Emax Rmin (deg) (n.m.) Emax Rmin (deg) (n.m.) Emax Rmin (deg) (n.m.) Emax Rmin (deg) (deg) (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (</td> <td>Code¹ Fired between Rmax & Rmin (n.m.) Bata at Bmin (deg) (deg) (n.m.) Emax (deg) (deg) (n.m.) Bmin (deg) (deg) (n.m.) Emax (deg) (n.m.) Emax (deg) (deg) (deg) (n.m.) Emax (deg) (deg) (deg) (deg) (n.m.) Emax (deg) /td> <td>Code¹ Between Emax & Runx Emax & Run Run Run Emax & Run Emax & Run Run Run Run Run Run Emax & Run Emax & Run Run</td> <td>Code¹ Between Bata at Emax Data at Rmin Data at Firing Point Remarks 9-30R-F5 Rmax & Rmin Emax &</td> <td> Code Between Rmax & Rmin Emax Bmin Emax & Rp Rpire Emax & Rp Rmax & Rmin Rmax Emax & Rmin Emax Rp Rpire Emax & Rp P-30R-F5</td> <td> Fired Between Bata at Runax Bata at Runin Bata at Firing Point Between Bata & Runax & Runin Ru</td> <td>Code1 Between Runx & Runx Encode Runx Bata at Runx Data at Runn Record Runn Record Runn Runn Runn</td> <td>Code1 Fired Data at Rmax Data at Rmin Data at Firing Point Recarks Code1 Between Rmax & Rmin Emax &</td> <td>Code¹ Filed Data at Rmax Data at Rmin Data at Firing Point Recarks 9-30R-F5 Funct Emax & Rmin Emax & Rmin<td>Code1 Between Runx & Runin Data at Runn Remax & Runin Runax & Runin Runin</td><td>Code¹ Prired
Between Data at Rmax Data at Rmin Data at Firing Point 9-30B-F5 Rmax & Rmin Emax & Rmin Emax & Rmin Emax & Rmin Emax & Rmin Rmax & Rmin Rmin Rmax & Rmin Rm</td></td> | Code ¹ Between Rmax & Rmin Bata at Rmin Data at Firing Point Remarks 9-30R-F5 Funax & Rmin In.m. Ideg) (deg) (n.m.) Ideg) (deg) (n.m.) Ideg) < | Code ¹ Between Rmax Rmin (n.m.) Bata at Rmin (deg) (deg) (n.m.) Emax Emax (deg) (deg) (n.m.) Bmin (deg) (deg) (n.m.) Emax (deg) (n.m.) Emax (deg) (deg) (n.m.) RFire (deg) (n.m.) Emax (deg) (deg) (n.m.) RFire (deg) (n.m.) Emax (deg) (deg) (n.m.) Remarks 9-30R-F5 yes 6.5 16.5 8.0 4.1 7.8 14.7 5.5 14 9.3 10-30L-G5 yes 6.5 17.9 20 4.1 7.8 2.0 2.0 4.2 1-15R-Mt yes 6.5 14 1.8 None 5.6 13.5 2.4 2-15R-Mt yes 6.4 18 11.2 4.0 8.0 20 5.6 14 10.9 3-15R-D3 yes 6.5 16 18.9 3.1 4.0 2.6 14 10.9 10 | Code ¹ Between Rmax Rmin (n.m.) Emax Rmin (deg) (deg) (n.m.) Emax Bm (n.m.) Emax Rmin (deg) (deg) (n.m.) Emax Bm (n.m.) Emax Rmin (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (deg) (deg) (deg) (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (d | Code ¹ Between Rmax Rmin (n.m.) Data at Rmin (deg) (deg) (n.m.) Emax Bmax Rmin (n.m.) Emax Bmax Rmin (n.m.) Emax Bmax Rmin (n.m.) Emax Bmax Rmin (n.m.) Emax Rmin (deg) (n.m.) Emax Rmin (deg) (n.m.) Emax Rmin (deg) (n.m.) Emax Rmin (deg) (deg) (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (deg) (deg) (deg) (n.m.) Emax Rmin (deg) (| Code ¹ Fired between Rmax & Rmin (n.m.) Bata at Bmin (deg) (deg) (n.m.) Emax (deg) (deg) (n.m.) Bmin (deg) (deg) (n.m.) Emax (deg) (n.m.) Emax (deg) (deg) (deg) (n.m.) Emax (deg) (deg) (deg) (deg) (n.m.) Emax (deg) | Code ¹ Between Emax & Runx Emax & Run Run Run Emax & Run Emax & Run Run Run Run Run Run Emax & Run Emax & Run Run | Code ¹ Between Bata at Emax Data at Rmin Data at Firing Point Remarks 9-30R-F5 Rmax & Rmin Emax & | Code Between Rmax & Rmin Emax Bmin Emax & Rp Rpire Emax & Rp Rmax & Rmin Rmax Emax & Rmin Emax Rp Rpire Emax & Rp P-30R-F5 | Fired Between Bata at Runax Bata at Runin Bata at Firing Point Between Bata & Runax & Runin Ru | Code1 Between Runx & Runx Encode Runx Bata at Runx Data at Runn Record Runn Record Runn Runn Runn | Code1 Fired Data at Rmax Data at Rmin Data at Firing Point Recarks Code1 Between Rmax & Rmin Emax & | Code ¹ Filed Data at Rmax Data at Rmin Data at Firing Point Recarks 9-30R-F5 Funct Emax & Rmin Emax & Rmin <td>Code1 Between Runx & Runin Data at Runn Remax & Runin Runax & Runin Runin</td> <td>Code¹ Prired
Between Data at Rmax Data at Rmin Data at Firing Point 9-30B-F5 Rmax & Rmin Emax & Rmin Emax & Rmin Emax & Rmin Emax & Rmin Rmax & Rmin Rmin Rmax & Rmin Rm</td> | Code1 Between Runx & Runin Data at Runn Remax & Runin Runax & Runin Runin | Code ¹ Prired
Between Data at Rmax Data at Rmin Data at Firing Point 9-30B-F5 Rmax & Rmin Emax & Rmin Emax & Rmin Emax & Rmin Emax & Rmin Rmax & Rmin Rmin Rmax & Rmin Rm |

For definition of code, refer to text. . S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Emax is 0 to 15 degrees. 4.5 Notes:

^{3,}

TABLE 9.3

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 10º

		Evaluation2	ω	ja.	ſ£4	124	(1)	ເນ	rn.	[14]	£.	[24	w	(A)	Ç	S	m	ы	so.	တ	£2.,	တ
		Remerks						}					!				:		:			
	Firing Foint	िम् (deg)	6-6	8	18,8	83	77	14	္ စ	\ \ \	>30	11.2	6.3	5.2	2.5	6.7	6.6	9 01	ပ္ စ	3.0	6.6	4.8
	t Firi	Emax (deg)	13.8	114	77	10.5	14.5	15.5	13	11.9	9.5	0.6	12.0	13.0	13	12	12.2	8.2	12.5	11.0	8.2	8.5
	Data at	RFire (nome)	5.4	5.6	5.6	5.2	5.6	5.4	5.3	5.4	5.5	4.5	4.5	5.0	5.1	8.7	5,3	4.9	5.4	4.5	5.2	7 * °C
)	in	(g_{ab})	174	88	18		15.1	8	7.8			11	6.5	5.4	6•7	9.9	10.8		15.6	3.5		4.5
0. 1	Data at R _{min}	Enax (deg)	8.0	8.0	7.9		0.8	8.5	8.2			4.5	7.9	7.0	8.0		4.2		5.0	7.5		5.9
Set No.	Data	Rmin (neme)	4.	3.9	0.7	None	4.3	3.75	3.75	None	None	0.4	3.7	3.9	3.9	3,9	2,88	None	2.6	3.9	None	3.6
	×	ER (deg)	7.2	19.8		Δ	3.8		7.3	>20	>20	13.6	5.3	5.6	1.5	8.9	8•6		80	3.7	10,1	5.2
	Data at Amax	Geg)	17	17	16.8	14.5	16.5	17.5	17.9	77	10.2	16.5	17	91	16.5	16.5	7.2	H	14.5	16.5	10.5	17.5
	Data	Enin (n.m.)	6.5	6.5	6.5	6.5	6.5	6.3	6.3	6.5	6.25	6.5	6.3	6.3	6•3	6.25	6.25	6.3	6.25	6.3	6.5	6.25
	Fired	Between Rmax & Rmin	zez Aec	yes	yes	Yes	ves	yes	yes	yes	yes	yes	yes	yes	ves	seľ	se£	yes	yes	yes	yes	yes
		Code	3-15a-D3	9-30R-F5	10-3cL-G5	1-158-54	5-15R-F5	8-301-32	2-151-C4	7-30R-D4	6-30L-B3	4-15I-E2	8-30L-E2	1C-30L-C5	3-15R-D3	4-15L-E2	7-30R-D4	5-15R-F5	1-15R-A4	9-30R-F5	6-30L-B3	2-151-04
	(Kun No•	1.79	642	643	7779	579	9479	279	879	679	059	159	652	653	654	655	656	657	658	629	099

For definition of code, refer to text. . S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Emax is C to 15 degrees. ٠<u>.</u> ۲ Wctes:

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Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 10º Set No. 1

Zvo Instino		נמ	ra,	4	2	တ	ا مع	***	(7)	S	ſt4	5	ír.	ທ	S	S	S	4	S	ſ±4	
	Remaires						-														-
Firing Point	ਜ਼ੁ (deg)	3.2	3,8	>20	3.0	5.5	14.2	200	6.1	9.1	<u>م</u>	6.9	15.5	0.9	12.0	20.0	8.9	200	9.8	11,2	× ×
	Emax (deg)	12.5	13.5	8.0	9	74.5	0.01	0,6	12.0	1.0	8.0	13.0	13	11	14.2	10.2	13.0	9.5	10.2	8.6	8.0
Data at	Rfire (n.m.)	4.8	5.4	5.0	4.06	5.5	4.3	5.5	4.07	4.5	3.6	5,3	5.4	4.7	5.3	7.4	5.2	- 2.4	4.7	4.5	9•4
n	ER (deg)	3.1	2.9		3.0	7.7	16.5		8.4	10.2	×20	10	15	6.4	71.2	13.1	17		10.3	>20	
Data at Emin	Fmax (deg)	0.8	7.5	·	0.9	0.8	6.5		8.0	7.5	0.4	8.0	8.0	7.5	6.5	7.0	0.8		7.0	5.5	
Data	Rmin (n.m.)	3.9	0.4	None	3.25	9.0	3.75	None	3.8	3.9	3.	0.4	7•0	0.7	3.5	3.9	3.75	None	3.0	3.6	None
×	(deg)	3.5	4.4	8,	3.7	5.2	8•4	& ∧	7.8	9.8	٨	8-7	17.0	8.6	12.9	0	3.4	8		•	& ^
at Rmax	Emax deg)		16.5	11	17.5	76	18	7	17.2	!	15	7.7	17.5	16.5	17.5	16.5	77.5	10.5	16.2	71	15
Data	Rmax (n.m.)	6.25	6,3	6.2	6.25	6.25	6•3	6.3	6.25	6.3	6.3	6.3	7.9	6.25	6.25	6.25	6.3	7.9	6.25	7-9	6.5
Fired	Between Rmax & Rmin	Ves	yes	ves	Sep	yes	yes	yes	yes	ves	yes	Ves	Ves	Ves	ves	Ves	2011	NO.	201	Yes	yes
,	Code	10-30165	4-151-E2	1-15R-AL	2-151-C4	5-15R-F5	8-30L-E2	6-30I-B3	3-15B-03	9-30R-F5	7-30R-DL	3-158-03	9-30R-F5	4-151-E2	2-151-04	5-15R-F5	6-301-F3	- 301 - Ba	301-05	7-30B-D/	1-15R-A4
	Run No.	1,99	662	649	1399	665	1999	667	899	599	929	167	677	673	62%	675	724	212	77.7	2 2	889

For definition of code, refer to taxt. . S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Zmax is 0 to 15 degrees. Notes: 1.

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Results of Simulation

TABLE 9.5

Attack-While-Search Mode Evaluation Deviated Fursuit, Lead Angle 10° Set No. 1

		Evaluation	νĵ	ſu,	(xq	ഗു	ഗ	တ	S	ш	ĵ u ,	СZ	(z,	CE.	ţæ	ທ	υ	[±,	Ø	ഗ	Ц	S
		Remarks																Fired 1.2 sec After R _{min}				
	Point	R. (deg)	7.8	14.2	ର ^	2.0	6.2	11.5	9.5	16	>20	10	15.1	16.5	13	10.9	8.7	3.0	•7	3.8	\ \ \	10.5
	at Firing Point	Emax (deg)	10	10.5	10.2	12	13.5	77[12	12,2	0.6	11.0	14.5	7	1	12.5	14.2	و°9	13	7.0	0.6	12.5
	Data at	RFire (n.m.)	8-7	4.5	5.8	8**	5.3	5.2	5.0	5,1	4.5	5.0	5.3	53	74	5.1	5.5	2.8	5.2	4.5	5.3	5.2
	F	FR (deg)	8	17		4.1	9.6	19.5	14.5			6.3		16.8	13.2	9.2	11.6	3.1	2.5	9.6		13.9
0	Data at Ruin	Emax (deg)	5.8	7.8		7.8	8.0	့ ရ	0*8	8.0		7.5	7.8	8.0	5.8	7.5	7.8	8.0	7.0	4.5		0.8
Sec No.	Data	Radin (neme)	3.5	3,8	None	3.9	3.9	3.75	3.8	0.7	None	0*7	3.75	3.8	3.4	3.0	4.0	3.8	3.8	2.5	None	3.75
	×	R. (deg.)	8.3	10.9	>20	2.5	4.4	6.5	4.3	13.8	20	11.5	10.5	16.5	13.9	13	8.2	3.3	1,6	άĵ	\ \ \ \ \	6.9
	Data at Amax	Frank (deg)	‡	16.5	10.2	17.	17	1.8	18	16.2	11.0	17.0	18	8.5	15	17	15.2	17	16	14.5	0,11	17
	Data	Rmax (n.m.)	6.5	6.25	6.3	6.3	6.3	7.9	ۥ9	6•3	6.3	6.3	6.3	6.25	6.3	643	6.25	6.30	6.25	6.4	7•9	6.3
	Fired	Between Rmax & Rmin	yes	yes	yes	Yes	Yes	Ves	yes	Yes	yes	765	Ves	7es	ves	Yes	Yes	ou	yes	уез	yes	yes
,	•	Code	7-30R-D4	10-301-65	1-15R-A4	9-30R-F5	3-153-03	2~15I~Ch	8-301-E2	5-15R-F5	6-30I-B3	4-15I-E2	2-15I-C4	5-15B-FF	7-30R-D4	9-30R-F5	1-151-E2	3-15R-D3	10-301-65	1-15R-A4	6-30L-B3	8-30I-E2
1.	<u> </u>	No.	.89	682	683	5.B.l.	585	686	687	889	689	069	691	692	693	769	695	969	269	869	669	730

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure.occurs. I - Run is incomplete. Useful range of Emax is 0 to 15 degrees. 44 Notes:

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TABLE 10

Summary of Results

Attack-While-Search Mode Deviated Purshit, Lead Angle 100

				8	Set No. 2						
Code	1-151-A4	2-15R-C4 3-15L-D3 4-15R-E25-15L-F5	3-15I-D3	4-15R-E2	5-15I-F5	6-30R-B3	7-301-D4	7-301-D4 8-30R-E		OL-F5 10-30R-G5 Totals	Totals
Successes		٠.	7	3	τ			7.7	7	9	31
Failures Due to Laurch Heading Errors	10	5	e/	3	· · · 6	10	10	5	4	α `	ં ક
Failures Due to Firing Before R _{max}					·				ď	ď	N
Failures Due to Firing After Fmin			·								લ
Failure to Fire When Permissible			·				·		п	· H	2
Total Runs Made	10	от	. 10	10	70	10	10	10	07	01	8
Potential Successes if Fired at R _{max}		7	6	8	6		п	₩	10	01	23

Total No. Valid Runs = 100
. Total No. Successes = 31.
Total No. Potential
Successes if Fired
at Rmax = 53

Percent Success = 31
Percent Potenttial Success = 53

Evaluatiof

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TABLE 10.1

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 10° Set No. 2

Codel

No.

After Rmin Remarks Fired (deg) 13.5 Data at Firing Point 8 82.7 8 8 8 ㅋ Emax (deg) 17.5 6.5 ER RFirs (deg)(n.m.) 10.5 % 1 2 823 88 8 84 뒤 8 8 Data at R_{min} Frax (deg) Rain (neme) 3.8 3.8 3.9 None None None ~‡ 122 ER (deg) 12.5 10,5 7.20 ଷ୍ଟମ୍ପର ଷ୍ଟ g Rmax 16.5 16.5 Fax 3 Data at Rmax (neme) 6.5 6.5 6.5 6.5 6.5 6.5 6.5 Rmax & Rmin Fired Between yes Yes 795 yes yes Yes Yes ves Yea 엁 2-14P-C4 10-30R-G5 7-30L-D4 5-15L-F5 3-15L-D3 2-15R-C4 8-30R-E2 1-15L-A4 10-30R-G5 6-30R-B3 9-30L-F5 4-15B-E2 9-30L-F5 6-30B-B3 4-15R-E2 3-151-03 7-30I-D4 8-30R-E2 1-151-A4

3635

704

SOBE

Sec

7°0

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. 4.5 Notes:

8

5.28

9

3.6

4 • 25 None

|∞ 8|8

88

3.75

16.5 16.5

6.5

yes

5-15L-F5 9-30L-F5 yes

10-30R-05 4-151-E2

yes

6.5

F - An attack failure occurs. I - Run is incomplete. Useful range of $E_{\rm max}$ is 0 to 15 degrees. ň

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Results of Simulation TABLE 10.2

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 10° Set No. 2

	Evaluation	Ē	Ce4	e.	Ŀ	F	Œ	F	S	(e,	F	(F.	တ	ന	လ	Ţ.	S	E4	[E4	£e,	S.	£.,	S	£4,	[2 ₁	Œ,
	Remarks												-			-		Fired 0.5 sec Before Rmax	Fired 1.8 sec Before Rmax						. [
Firing Point	ER (deg)	13	8	1,4	0. <		>20	×30	1	82	8	16.5	7.5	8.5	7.5		8.5	н	2.5	>20	2	8	٠-,	& ^	8	10.5
Firing	Emax (deg)	11.5	12.5	10	10		10	7	11.5	10.5	11.5	111	13.5	5.6	116		174	18	8	7	10.5	,12	6	10	6	
Data at	RFire (n.m.)	5	0.9	5	5.8	None	6.5	7	5	6.5	5.3	2	5.5	4.5	6.5	None	5.9	6.8	7.5	5.5	5.25	5.2	4.5	٦,	5.5	4.2
	ER (deg)	۵۲		15.5		>20			7.5		ο 2 <	>20	21	5.7	9.5		34.5	8.5	1.5		2	220	7.5			10.5
at Rmin	Emax (deg)	¢		7		9			7.5		8	7.5	8	9	7		8	7.5	7		~	7.5	9			2
Data	Rmin (n.m.)	7	None	4	None	3.75	None	None	7	None	4.1	3.75	3.9	77	4	None	4	7	4.2	None	-1	8	3.7	None	None	4.2
×	ER (deg)	0	8	13	82	1.7		\ (2)	1.5	>20	20	ורו	5.5	9.5	7.5	8	9	2	21		7.5	17	8	202	22	<u>;</u>
Data at Amax	Emax 3 (deg)	16.5	7	15.5	10	17		15.5	17	10	16.5	16.5	17	16.5	16	77	17	97	16		16	17.5	17	7	9	76
Data	Rmax (nem.)	6.5	6.5	6.5	6.5	6.5	None	6.5	9*9	6.5	9*9	6.5	6.5	6.5	6.5	6 9	6.5	6.5	6.5	None	6.5	6.5	5•9	6.5	6.5	6.5
Fired	Between Rmax & Rmin	YOU	ves	ves	yes	9	on	уев	Ves	Yes	YBS	Ves	Ves	Ves	YAS	g	yes	no	OU	no	738	yes	yes	Yes	Yes	yes
	Code	3-1 51_N3	7-301-D4	5-15I-F5	6-30R-B3	8-30R-E2	1-151-1	2-15B-C4	8-30R-E2	6-30R-B3	5-15I-F5	9-30I_F5	3-151-03	4-15R-E2	10-30R-G5	7-30I-D4	3-151-03	9-30L-F5	10-30R-G5	1-15L-A4	5-151-F5	8-30R-82	2-15R-C4	7-30L-D4	6-30R-B3	4-15R-32
P	No.	7.04	727	728	729	730	731	732	733	737	735	736	737	738	739	71.0	77.7	74.2	74.3	777	74.5	977	747	248	74.9	750

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. Useful range of Emax is 0 to 15 degrees. ۲. % Notes:

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10.3
TABLE

Results of Simulation

Attack-While-Search Mode Bvaluation Deviated Pursuit, Lead Angle 10º Set No. 2

	Realmation2		: 64	, [2	, ,	2		EL .	ís,	ß,	UB.	,	z., (2	S	S	E.	(ea	£2.	4	124		S	ís.	S	fa,	[II.g	S	[24	
	Demondre	Religins		Could Have	Fired			Fire 0.5 sec			Could Have	Fired																		
-	Point	(deg)	2.2	1		-7	17	8	8^	8			8	15	9	2	8	15.5	×8	8	25.55	8	H	77	12	10.5	80	4.05	17	
	Firing Point	Emax (deg)	9	1		11	11	81	10.5	a			9.5	15	16	1	4	α	2		125	7	11.5	01	12	0	-	0	1.5	
	Data at	RFire (n.m.)		4	None	2	7.4	6.9	1 .	- Lu	200	None	5.5	6.25	6.5	67	2 2	-	7 4	-	2.5	2	5.2		6.3	-	t er	2 4	100	*
		ER (deg)		8	8	4.5	17	\ \ \	5	8		8		13	70	-	#	8	विह	18	4		0	,63	31:		16	3 4	_	2)7
200	at Emin	Geg)		7.51220	**	00	{	5		×0	i	7.5 >20		4	2	2		1	1	L		-	-	-	00	♣	4	1	4	9
Set No.	Data	Rain		7	4	1. 25	3.75	3.25		8,	Nozie	3.9	None	3 6	000	20.7	7	None	200		30.7	2 2	10110	± c	*	0	2	200	7	7.0
		(geg		9.5	ı	C	10	8		28		27	02.5	:	75.5	0	7.7	8	7.7	NA.	15	77.52	7 00	3	3	7	25	X	٠٠ <u>٠</u>	17.5
	at Rmax	Eman 3	i	27.5	16.5	1,1	74	T		72		16.5	9	1	C.01	9	9	10.5	77	97	17	27	1	27	9	17	16.5	76.5	C•07	16
	Data	Bmax (n.m.)		6.5	6.5	1	200	7 4	;	6.5	None	6.5	4 5		6.5	6.5	6.5	6.3	6.5	6.5	6.5	٠ • •	None	6.5	6.5	6.5	6.5	6.5	9.	6.5
	Fired	Between Rmax & Rmin		Ves	02		yes	yes	2	yes	on	ou.		Yes	yes	yes	yes	yes	res	yes .	yes	yes	OL.	yes	yes	yes	yes	yes	yes	yes
		Code ¹		8-30R-R2	10-30R-G5		3-151-13	4-158-152	40-205-7	5. 151 F5	1-151-44	9-30I-F5		6-30K-13	2-15R-C4	10-30B-C5	4-15R-E2	1-151-AL	2-15B-CL	5-151-F5	8-30R-E2	6-30R-B?	3-151-03	9-30L-F5	7-301-D4	3-151-03	9-30L-F5	4-15R-E2	2-15R-C4	5-151-F5
		Run No.		7.63	75.2		753	754	755	756	757	758	3	759	092	761	762	763	764	765	766	767	768	69%	770	777	772	773	71,12	775

Notes: 1. For definition of code, refer to text.
2. S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.

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^{3.} Useful range of Emax is 0 to 15 degraes.

Attack-Mhile-Sea : h Mode Evaluation Deviated Pursu. : Lead Angle 10° Set : 0. 2

						361	2.0						
		Fired	Data	at Rmax	*	Data	at Rmin	'n	Data at		Firing Point	f	2
No.	Code	Rmax & Rmin	Rmax (neme)	Fee (deg.)	.3g)	Radin (n.m.	(gep)	R. (deg)	RFire (neme)	Ena: (deg)	ER (deg)	Renarrs	Pratuacton
70%	\$_3∩R_#?	ç	6.5	71	16.5	3.6	4	×20	None				Œ
2 2	A 30B R	467	2.5		S S	1			4.5	6.5	>20		(z.
77/A	19-388-65	Yes	6.5		3.5		2	٠,	7	80	4.5		တ
5/2	7-30I-DA	Yes	6.5		8	1		8	9	2	83		[24]
8	1-151-14	2	None						5	3.5	82		[24
28	7-30L-D4	yes	6.5	16	88	None			5	10.5	88		(4)
282	10-30R-G5	Ves	6.5	16	8	3.8	7	7	807	10.5	30		S
ž	7-151-44	QL.	None			None			9	9.5	83		-
78.		VAS	6.5	16	5	4.0]	7.5	6.5	5	11.05	3.5		S
200			6.5		7.	7	7.5	10.5	14.8	7	7.5		S
786	2-15B-CL		6.5	18	80		9	Ħ	8.1	п	20.5		တ
787	L		6.5		6.5	3.9	8	16	8•1	11.5	11.5		ונט
788	L		6.5	1	82	3.9	7	>30	4.5	6	8		2.
789	L		645	i	82	2			5	6	8 S		3,
96		ye s	6.5	16	13.5	3.9	9	9.5	4.5	9.5	10.5		-
791	2-15R-C4	yes	6.5	15.5	>20.	None			3.5	9	8		E- 1
792	5-151-F5	Yes	6.5	15.5	13	7	2	13.5	5.5	12	13		[84 1]
793	7-30L-D4	yes	6.5	14	R	None			5.5	10.5	8		24
76%	9-30L-F5	yes	6.5	16	1.5	77	6.5	11.5	6.5	97	1.5		8
795	4-15E-E2	O:I	6.5	16.5	14.5	7.5	7.5	11.5	3.7	5.5	п	Fired 0.5 sec After Rmin	E4
70%	3-151-113	VAS	6.5	17	2	7	7	11.5	4.7	10,5	8.5		ς2
100	10-30B-C5	768	6.5	97	80	4	7	9	6.5	76	80		(1)
708	1-151-AL	or	None			None			None			-	2
00	6-30B-B3	Ves	6.5	11.5	230	None			5.5	80	88		24
100	8-30R-E2	708	6.5	17,	5.5	7	∞.	16.5	5.2	77	9.5		co.
		-		-									

3. Useful range of Emax is 0 to 15 degrees. For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete. 1. % Notes:

TABLE 11

Summary of Results

Attack-While-Search Mode Deviated Pursuit, Lead Angle 180 Set No. 1

				Zet Zet	Set No. 1						
Code	1-15R-A4	2-151-C4	2-151-C4 3-15R-D3	4-151-EZ	5-15R-F5	6-301-B3	7-308-D4	8-301-EZ	4-151-E2 5-158-P5 6-301-B3 7-308-D4 8-301-E2 9-30R-F5 10-30-C5	10-30-05	Totals
Successes	5	8	6	9	м	-	2	. 60	60	9	85
Failures Due to Laurch Heading Errors	7	2	re	-4	. 6	6	~		2	4	38
Failures Due to Firing Before Emax	1				·		100			,	r.
Failures Due to Firing After R _{min}		·	·								
Failure to Fire when Permissible	·							H			н
Total Runs Made	10	10	01	10	10	10	10	*	OI],	66
Potential Successes If Fired at Rmax	7	6	01	7	24	4	to	6	10	9	. 72

Total No. Valid Runs = 99
Total No. Successes = 59

Total No. Potential Successes if Fired at Ruax = 72

\$ Success = 59.6

\$ Potential Success = 72.8

* One Run of 8-30L-E2 was Incomplete.

TABLE 11.1

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 1

	on ²																				
	Evaluation ²	တ	တ	တ	S	त	တ	(Sag	တ	တ	લ	Ħ	ਖ਼	က	တ	တ	Ŀ	S	스	S.	ध
	Remarks															-	Fired 3.6 sec. Before Rmax				
Data at Firing Point	ER (deg)	3.1	5.6	11.8	6•€	9*81	8°0	>20	8.6	10.8	>20	28	13	5.2	3.7	7.1	71	13.5	5.6	3.5	13.5
at Firi	Emax (deg.)	.11.5	10.5	7 1	91	12	7	12.5	13.8	12.5	6.5	14	12	12	16	77	18•5	7 7	6	10	6.6
Data (RFire (n.m.)	9•4	4.7	5.1	5.2	8•4	5.5	8.4	5.2	6•4	4.7	5.3	8*7	7.4	5.6	5.7	6°2	7.5	7° 9	L•4	6•47
min	ER (deg)	8•4	220	16.5	6.5	19.7	2.0	8	52	9.5		<u>م</u>	13.9	7.5	11.9	7.0		18		8*17	
Data at Emin	Emax (deg)	7.8	5.0	0° 6		8.0	8°0	8.5	8.5	8 °0		8 0	8.0	0.7	8.0	0.9		7.5		6.5	
, w (Rmin (n.m.)	0•4	3.25	3.8	3.75	0•7	3.75	3.5	0.4	0•7	None	3.9	0•4	3.8	3.8	3.6	None	3.8	None	0.4	None
пах	ER (deg)	5.6	4.2	6° 2	3.7	18.5	2.5	8	13	13	8	139	11.5	7.2	3.1	80	10.2	13.3	8.5	1.0	12
Data at Rmax	Emax ³ (deg)	87	15	18	18.5	18	16.5	18.5	17	18	12.5	17.5	18	17.5	18	15	12	16.5	12	17	13.5
.BQ	Rmax (n.m.)	6.5	7.9	7.9	6•3	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7.9	6.5	6.5	6.5	5•9	7°9	6.5	6.5
7	Between Rmax & Rmin	yes	yes	yes	уев	yes	yes	yes	уев	yes	yes	yes	уев	yes	yes	yes	no	уев	yes	уев	yes
	Codel	8-30L-E2	1-15R-M	3-15R-D3	2-151-C4	10-30L-G5	7-30R-D4	5-15R-F5	23-151-17	9-30R-F5	6-30L-B3	4-15I-E2	3-158-03	2-15L-C4	8-30L-E2	7-30R-D4	1-15R-A4	10°30 1 ~G2	6-30L-B3	9-30R-F5	5-15R-F5
	Run No.	801	88 83	දි	708	805	808	807	808	608	810	811	812	813	814	815	816	817	818	819	820

Notes

Useful range of Rmax is 0 to 15 degrees.

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 4.5

TABLE 11.2

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 1

			Dat	Data at Rmax	ж	Dat	Data at R _{min}	ntn	Data a	t Firi	Data at Firing Point		.*
Run No.	Codel	Fired Between Rmax & Rmin	Rmax (n.m.)	Frank (deg)	ER (deg)	Ranin (n.m.)	Emax (deg)	(ਤep) ਮੁਤ	RFire (n.m.)	Emax (deg)	R (deg)	Remarks	Evaluation ²
Ş	0 300 PE	O TA	6.5	7.1	13	0.4	7.8	15.2	5.4	3.2	13.2		တ
38	10-301-05	VAS	6.5	17	14.8	4.1	8.0	13	5.5	14	77		တ
ž	1-151-E2	Ves	6.5	17	9.5	0.4	7.8	9°01	4.9	7	6.6		တန
3	1-1 SR-AL	ou	None			None			None		,	Did Not fire	4 6
2	2-15I-C4	yes	7.9	17.5	3.4	3.8	8.0	10.8	5.4	16	2.3		n c
3	3-15R-D3	yes	6.5	18	12.5	7.0	7.5	7.5	9•4	10.5	0.0		ממ
2	7-308-D/	Ves	6.5	15.5	97	2.6	0.9	9.1	4.7	9.5	8		מ
200	5-1 5R-P5	468	6.5	17	19.8	0.4	8.5	>30	5.4	77	28		×, (
88	6-301-R3	708	6.5	١٠,	720	None			5.6	ឧ	<u>ک</u>		34,
200	8-30I-R	AGS	6.5	18	2.0	3.9	8.5	₩8	5.7	16	3.5		S
3	1-15R-4/	Ves	6.5	14.5	4.5	3.4	5.5	>20	2.6	12	7.0		2
32	2-151-04	Ves	7.9	18	1.5	3.7	7.8	>20	4.5	12	14.2		2. 0
32	8-301-E2	Yes	6.3	18	3.3	3.9	8.0	7.0	4.5	Ħ	2		n
3	ER-10E-9	768	6.3	13.5	14.9	None			5.5	12.2	15.2		£, £
5	5-15R-F5	Ves	6.5	16.2	15.4	3.8	8°0	>20	5.7	15.5	17		,
18	9-30R-P5	Ves	6.5	17.2	14.2	3.8	8•0	11.3	5.7	16	13.8		2
232	3-15R-D3	Ves	7.9	17	2.0	0.7	8.0	1.0	5.2	13.5	1.0		2 4
300	1-15T-15	867	2.9	17.5	17	3.8	8.0	>20	5.5	77	17.9		£4
9	10-301-65	200	2.5	17.5	19.4	3.75	8	×80	L•S	16	19.8		24
	7-30R-D/	200	6.5	10.2	0.9	3.6	0.9	14.5	9.5	13.5	10•3		S
2	1 - 7010	300	<u>`</u>										

Notes:

3. Useful range of Emax is 0 to 15 degrees.

For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete. 4.5

TABLE 11.3

The section of the se

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 1

		i	Dat	Data at Rmax	la X	Det	Data at Radn	dn	Data at	Data at Firing Point	Point		
Run Yo.	Codel	Fired Between Rmax & Rmin	Rmax (n.m.)	Enax?	ER (deg)	Rmin (n.m.)	Emax (deg)	Ry (deb)	RFire (nome)	Emax (deg)	ER (deg)	Remarks	Evaluation ²
148	3-15R-D3	yes	6.5	17	1.0	0.4	8.5	4.5	505	16.5	1.1		တ
842	9-30R-F5	yes	6.5	17.5	14.5	4.1	8.0	11.5	5.5	15	13.5		တ
843	10-30L-G5	yes	6.5	16.5	10	4.1	8.0	91	5•1	12.5	37.5		S
844	1-15R-A4	yes	6.5	14.2	10.5	None			9 •9	14	11.5		S
14.5	5-15R-F5	yes	6.5	18	>20	3.7	7.5	>20	5.4	15.5	×8		Cs.,
977	8-30L-E2	yes	6.5	18	8.8	0*7	8.5	2.6	5.3	14	6.5		S
847	2-151-C4	yes	7.9	16.5	5.8	3.8	7.8	0*9	9*4	10.5	6.5		တ
848	7-30R-D4	yes	7.9	17	11.8	6.25	6.5	12.1	5.1	13	12.8		S
849	6-30L-B3	yes	6•3	12	14.1	None			6.3	12	14.1	Fired at Rmax	ſz,
850	4-15I-E2	уев	6.5	17	11.2	0.4	0•9		4.5	10	10		တ
<u>द</u>	8-30L-E2	yes	6.3	17.5	8.5	3.75	8,0	16.8	5.5	15.5	30°2		တ
152	10-30L-G5	yes	6.3	16.5	10.8	3.75	7.0	10.9	4.5	10.5	8.6		S
:53	3-15R-D3	yes	7.9	17.5	0.2	3.9	8.2	2.7	2.4	14.5	0.8		တ
54	4-15L-E2	yes	6.5	17	12.7	0*7	6.2	12.6	9•4	21	12.3		ſ2,
155	7-30R-D4	yes	6.5	5.41	19	3.25	5.5	88	5•3	11.8	19		Œ,
856	5-15R-F5	yes	7.9	18	>30	3.75	8.5	×8	5.2	77	8		œ,
857	1-15R-A4	yes	6.5	5*71	10.5	3.0	0.4	>50	2•0	п	16.5		(E,
158	9-30R-F5	yes	6.5	17	7.9	0•7	8.0	6.7	5.6	14	7.0		တ
859	6-30I-B3	yes	†*9	5°TT	17.2	None			2.6	10	17.6		न
98	2-151-C4	ou	7.9	18	1.6	3.8	8.5	5•11	6.5	18.5	1.6	Fired 0.3 sec. Before Rmax	တ

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 년 **성** Notes:

Useful range of Emax 1s 0 to 15 degrees. 3

TABLE 11.4

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 180 Set No. 1

		To at	Dat	Data at Rmax	ж	Dat	Data at Rmin	dn	Data a	Data at Firing Point	g Point		
Run No.	Codel	Between Rmax & Rmin	Rmax (n.m.)	Emax (deg)	(geb) ਮੁੱਬ	Radn (n.m.)	Emax (deg)	ER (deg)	RFire (n.m.)	Emax (deg)	(deg)	Remarks	Evaluation ²
198	10-301-65	80	5.9	17	8	0.7	•	8	1				
862	4-151-E2	yes	6.5	-2-	13.1	0.00	Ŧ	3,5	0	200	22		G.
863	1-15R-A4	Ves	6.5	7	100	2.0	2	77.	20,	<u>ر</u>	13		တ
1					•	?	?	17.02	5.6	14	8.0		S
† 1 108	2-151-C4	ou .	6.4	14.0	18.4	3.75	8.0	77.	2.7	5.0	77	Fired lo2 sec.	ĵ±,
ĝ.	2-15K-r5	yes	6.5	18	28	3.75	8.5	28	5.5	16	(8)	uim, min	
8	8-30I-E2	yes	6.5	17.8	4.5	3.8	1	15.5	7 2	1/2	7,7		**
8	6-30L-B3	yes	6.5	12.5	11.8	None			7.3		000		20
898	3-15R-D3	Ves	6.5	17.5	3 01	300	,		20.	2.00	12.5		Œ,
698	9-30R-F5	Ves	7 2	72.45	200	7.0	200	13.2	7.8	77	12		တ
830	7-30R-DL	VAc		1	7	0.4	0.0	75	5.2	12.5	14		CE.
871	3-15R-D3	2004	5	2 2	794	2.0	0.0	17.8	5.0	12	12.8		Cz.
872	9-30R-F.	200	7.0	20,5	2,0	0.7	8.5	10	5.3	13.5	2.5		S
873	1-151-R2	202	200	77		401	0.8	2.9	5.0	12.5	6°T		S
į		22.5	•	7	740.7	3.9	0.0	17.7	4.04	22	16.8		íz,
1/0	Z-151-C4	ou	6.5	11.5	11.5	0•7	7.0	14.2	6.7	15.5	75	Fired 0.3 sec.	S.
6/2	5-15R-F5	yes	6.5	17	16	0.7	0.0	220	7 7	22	7.	9	
+	8-30L-E2	yes	6.5	18	4.5	0-7	Т	77	2 2	1	2	rired at Mmax	S
╅	6-30L-B3	yes	6.5	11	14.9	None			30	\$ 5	200		so t
+	10-301-65	yes	6.5	17.5	12	3.9	8.0	78	7	17 5	120	C To Form	٤. ا
8/3	7-30R-D4	yes	6.5	17.5	11.5	3.75	0.4	77.6		1	31,	rired at max	'n
88	1-15R-A4	yes	6.5	1.5	10	,,,,			7.04	\$	7		တ
						7.6	4.0	57	2.8	4	7		S

3. Useful range of Emax is 0 to 15 degrees.

Notes: 1. For definition of code, refer to text.
2. S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.

TABLE 11.5

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 1

										F-4 -	_	_			_	_	-	_	_	· —	_
	Evaluation 2	ഗ	S	Ŀ.	F	တ	S	e,	ÇE.,	सं	S	Ś	Œ.	Ą	S	S	S	ভা	Œ,	S	ĭ
	Remarks			Did Not Fire				Did Not Fire													
g Point	ER (deg)	7.9	12.7		12,8	3.2	12.6		>20	15	8*8	7.3	>20	15.2	11.2	12.6	3.4	>20	>20	7.8	
Mrin	Emax (deg)	11.5	15.5		12	13	13.5		15.5	01	77	13	15.5	13	14	15.6	14	16	17	9.5	
Data at Firing Point	RFire (n.m.)	5.2	5.3	None	5.1	5.0	5.3	None	5.2	9•5	5.4	6.4	5.5	5.5	5.5	504	5.4	5.4	6.0	5.3	
nin	फ़्र (deg)	10.2	2	6.5	76	6.2	8.5	15.2	023		8•3	13.8	>20	18	12.8	12	4.7	>20		>20	
Data at R _{min}	Emax (deg)	6.5	7.5	4	0*8	8*7	8*1	8.5	0*8		7.8	0*8	.0*8	0*9	7.5	0*8	ე•8	8•0		5.5	
Dat	Rmin (n.m.)	3.75	3.9	3.25	3.9	0.4	3.8	3.75	0*7	None	4•1	3.8	3•9	3.5	4.0	0•4	4.0	3.75	None	1.75	
ax	(gap) ER	7.9	13	15	11.1	0•1	13.9	7.8	>50	15	0.6	6.€	>20	15.5	11	13.5	2.5	>30		6.7	
Data at Rmax	Emax (deg)	16	16	12	17	17	14.5	17.5	16.5	10.5	3.6	18		15	16.5	16.5	17	17.5		12	
Dat	Rmax (n.m.)	4.9	6.3	6.5	6.5	†*9	5.9	5 •9	5•9	5 *9	6.5	7*9	5*9	7*9	6.5	5*9	5*9	5*9	None	7*9	
7	rired Between Amax & Amin	yes	yes	ou	yes	se£	yes	ou	se£	yes	yes	yes	yes	yes	sə4	seá	yes	yes	ou	yes	
	Code	7-30R-D4	10-30L-G5	1-15R-A4	9-30R-F5	3-15R-D3	2-151-C4	8-30L-E2	5-15R-F5	6-30L-B3	4-15I-E2	2-151-C4	5-15R-F5	7-30R-D4	9-30R-F5	4-15L-E2	3-15R-D3	10-30 1-G 5	1-15R-A4	6-30L-B3	8-301-E2
	Run No.	188	288	883	788	885	886	883	888	886	86	891	892	893	768	895	968	268	868	668	906

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. . . Notes:

3. Useful range of Emax is 0 to 15 degrees.

TABLE 12

Summary of Results

Attack-While-Search Mode Deviated Pursuit, Lead Angle 180 Set.No..2

Code	1-15I-A4	2-15R-C4	8-151-E	4-15B-E2	5-15L-F5	6-30R-B3	7-301-D4	8-30R-E2	9-30L-F5	2-15R-C4 3-151-D3 4-15R-E2 5-15L-F5 6-30R-B3 7-30L-D4 8-30R-E2 9-30L-F5 10-30R-G5 Totals	Totals
Successes		9	7		Н	ri	2	5	8		8
Failures Due to Launch Heading Errors	10	7	ε,	6	∞	7	₩	73	2	10	89
Failures Due to Firing Before Emax											
Failures Due to Firing After R _{min}			3	٦				6			₩
Failure to Fire When Permissible						ત					8
Total Runs Made	10	10	10	10	10	0T	10	10	10	10	82
Potential Successes If Fired at Pmax		9	10	ત્ય	CV.	9	3	10	7	ίυ	67

Percent Success = 22
Percent Potential Success = 49

Total No. Valid Runs = 100
Total No. Successes = 22
Total No. Potential
Successes

TABLE 12.1

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 2

			Dat	Data at Rmax	хві	Data	Data at Rmin	dn	Data at Firing Point	Firing	Point		
Run No.	Code	Fired Between Rmax & Rmin	Rmax (neme)	Emax 3 (deg)	æ (gep)	Radin (neme)	Emax (deg)	Ra (gep)	RFire (n.m.)	Emax (deg)	हुई (deg)	Remarks	Evaluation ²
ક	A_30B_R2	SWA	6.5	18	12.5	4.1	₩	6	4.2	σ.	6		S
205	1-151-1	ဥ	None			None			5.5	22	×20		F
8 E	3-151-03	ou	6.5	17	4.5	-4	₩	8.5	3.6	6.5	6	Fired O.6 sec. After R _{min}	fæ,
100	2-1 5R-CL	ves	6.5	17	0	3.8	2	7.5	7	60	7.5		ß
9	10-30R-G5	Ves	6.5	17.5	8	4.	9	82,	5.5	14.5	>30		ſe,
900	7-30L-D4	yes	6.5	15.5	9	3.8	9	16.5	4.5	9.5	11.5		Œ4
206	51-151-P5	уез	6.5	17	ķ	3.9	80	>20	4.5	10.5	>20		(z.,
806	4-15R-B2	51 C1	6.5	17	>20	7	₩	8	3.6	6.5	19.5	Fired O.5 sec. After R _{min}	ᅜ
606	9-30I-F5	Ves	6.5	17	13	77	7	12.5	4.05	10.5	12		(Z.,
916	6-30R-B3	ou	6.5	77	9	2.75	5.5	8	None			Could Have	(Se
911	4-15R-E2	yes	6.5	17	18	3.9	7	\ \ \ \	4.1	9.5	>20		F
912	3-151-D3	yes	6.5	17.5	7.5	3.75	8	13.5	4.5	12.5	10.5		S
913	2-15R-C4	yes	6.5	18	7.5	3.9	8	18.5	5.4	14	11		တ
716	8-30R-E2	yes	6.5	17	2	7	8	8.5	4.6	12	7		S
915	7-30L-D4	yes	6.5	14.5	19	3.2	5	>20	5	10	19		দ
916	1-151-14	ou	None			None			5.5	36	۶ ج		Œ.
917	10-30R-G5	OĽ	6.5	17	>20	3.75	2	02<	7	R	8	Fired 1.1 sec. Before Rmax	Ħ
918	6-30R-B3	798	6.5	11.5	>20	None			4.5	8	>20		ja,
919	9-30L-F5	yes	6.5	16.5	19	3.75	5*9	>20	5.3	12.5	1220		(2,
920	5-1.5I-F5	ye9	6.5	16.5	>20	3.6	6.5	×20	4.5	п	Ω		F

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 4% Notes:

Useful range of Errax is 0 to 15 degrees.

TABLE 12.2

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Furauit, Lead Angle 18° Set No. 2

Fired Data at Ruax Data at Luin	Data at Ruax Data at Luin	ta at Ruax Data at Luin	Data at Lann	Data at Emin	ita at limin	es es	es es	a	ta at	Firing	Data at Firing Point		Evaluation2
Ode Between Hmax Emax Exp BR Brin Brix BR	$\begin{pmatrix} H_{max} & F_{max} \end{pmatrix} \begin{pmatrix} B_{n} & F_{m} \end{pmatrix} \begin{pmatrix} B_{n} & B_{min} \end{pmatrix} \begin{pmatrix} B_{max} & B_{min} \end{pmatrix} \begin{pmatrix} B_{max} & B_{min} \end{pmatrix}$	$\left \begin{array}{cc} \mathbf{E_{max}} & \mathbf{E_{m}} \\ (\mathrm{deg}) \end{array} \right \left(\mathrm{deg} \right) \left(\begin{array}{cc} \mathbf{n_{*m}} \\ (\mathrm{n_{*m_{*}}}) \end{array} \right) \left(\begin{array}{cc} \mathbf{E_{mix}} \\ (\mathrm{deg}) \end{array} \right)$		Rmin Emax (neme) (deg)	Kata (deg)		(gen)		Tryre (nome)	deg)	(deg)	itemark s	Evaluation.
9-301-F3 yes 6.5 17 11 3.9 7 11.5	6.5 17 11 3.9 7	17 11 3.9 7	11 3.9 7	3.9 7	7	·	11.5		4.2	6	11		ít,
6.5 17 13 4 7	6.5 17 13 4 7	5 17 13 4 7	13 4 7	4 4	7		14.5		4.1	8	7,		ix.
yes 6.5 17 17.5	6.5 17 17.5 4 8	17 17.5 4 8	17.5 4 8	8 7	æ		16		5+5	77	17		Ŀ
no None	None	2	None	None	None				5	13.5	>20		ſz,
yes 6.5 1.7 1.6	6.5 1.7 16 3.75 6	1,7 16 3,75 6	16 3.75 6	3.75 6	9 9	9	14.5		7	80	14		ŢŦ4
3-151-13 yes 6.5 17.5 14.5 3.8 8 >20	6.5 17.5 14.5 3.8 8	17.5 14.5 3.8 8	.5 14.5 3.8 8	3.8 8	₩	₩	Ŕ		5.5	13.5	16.5		وعا
yes 6.5 17 16 3.5 5.5	6.5 17 16 3.5 5.5	17 16 3.5 5.5	16 3.5 5.5	3.5 5.5	5.5	5.5	8		3.5	5.5	ج کا		CE-,
5-151-F5 yes 6.5 17 \>20 3.9 8 >20	6.5 17 >20 3.9 8	17 (>20 3.9 8	>20 3.9 8	3.9 8	80		ୡ		9•4	8	>20		ſz,
yes 6.5 11 >20 N	6.5 11 >20	280	280	-	None				L*4	8	>20		(E.,
no 6.5 17 4 4 8	6.5 17 4 4 8	17 4 4 8	\$ 1 7 17	4	to		ಹ	8.5	2.8	5	6	Fired 1.1 sec. After R _{min}	Ē4
1-15L-AL no None	None		None	None	None				5	13	>20		e.
6.5 16 2.5 3.6 6	6.5 16 2.5 3.6 6	16 2.5 3.6 6	2.5 3.6 6	3.6 6	9	-	7	4.5	5.5	13	2.5	·	S
8-30R-E2 yes 6.5 17 5.5 3.8 6 13.5	6.5 17 5.5 3.8 6	17 5.5 3.8 6	5.5 3.8 6	3.8 6	9		13	•5	6.4	9.5	11.5		íz,
yes 6.5 12	6.5 12 16.5	12 16.5	16.5		None				5.5	æ	17.5		ĹŁ,
5-15I-F5 no 6.5 1? 18.5 3.8 7 >20	6.5 1? 18.5 3.8 7	1? 18.5 3.8 7	18.5 3.8 7	3.8 7	2		8		3*5	4.5	>20	Fired 1.5 sec. After Rain	Ćtų .
9-30L-F5 yes 6.5 16 8 3.9 7 13.5	6.5 16 8 3.9 7	16 8 3.9 7	8 3.9 7	3.9 7	2		a	3	9.4	10	11.5		F
16.5 2.5 4 6	6.5 16.5 2.5 4 6	16.5 2.5 4 6	2.5 4 6	7 9 7	9		5	5	4.5	9.5	3.5		S
4-15R-E2 no 6.5 15.5 5.5 4 7 5	6.5 15.5 5.5 4 7	15.5 5.5 4 7	5.5 4 7	4 7	7		70		3*0	4.5	4.5	Fired 1.0 sec. After Rmin	ᄺ
8.5	6.5 16.5 8.5 4 6	16.5 8.5 4 6	8.5 4 6	.5 4 6	9		6	'n	4•1	40	6		F
6.5 13.5 2	6.5 13.5 >20	13.5 >20	>20		None				3	ν.	>20		ţ.

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 4.5 Notes:

Useful range of Emax is 0 to 15 degrees.

Results of Simulation

Attack-While-Search Wode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 1

	Evaluation ²	(te ₁	ír,	Œ,	EL,	ţe,	Œ4	တ	တ	Œ,	ít.	တ	ſŁ,	(3 ₄	Œ,	Œų	ſz,	£4,		Ce.,	Ē4
	Remarks	Fired 0.5 sec. After Rain				Fired 1.0 sec. After R _{min}					Fired O.4 sec. After Rain										
Point	ER (deg)	ដ	×30	ŧα	8	æ	11	9	10	15.5	30	સ	ଛ	14.5	23	>30	>20	22	7.5	19.5	
Firing	Emax (deg)	€0	3.	7	6.5	5•5	9.5	16	12	8	80	12	10	8	12	7.5	TI.	8	1.8	8	
Data at Firing Point	RFire (nom.)	3.6	5.2	3.9	6.2	3.5	4•1	9	5.5	5.2	3.5	5	4.5	3.75	8•4	7	5	9•4	6.5	5	None
ակո	ER (deg)	12	^ 3 8	8		17.5	7	7.5	9.5		19.5	7.5	>20	14.5	>20	>20	>20		4		
Data at R _{min}	Emax (deg)	6	6	2		∞	80	80	9		8.5	8.5	60	80	80	5	8		8		
Dat	Ratn (n.m.)	3.8	3.7	6•€	None	4	-7	3.75	3.6	None	3.9	3.9	3.75	3.75	3.75	3.2	8•€	None	3.9	None	None
DAX.	照 (gep)	4.5	R	11.5		11.5	12.5	5.5	11.5	12.5	8	10	18.5	∞	18.5	83	19.5	>20	7.5	14.5	>20
Data at Rmax.	Emax ³ (deg)	17.5	18	17		16.5	18	3.8	16	13	17	18	17	17	18	15	17	14.5	18	ដ	15
	Emax (n.m.)	6.5	6.5	6.5	None	. 6.5	6.5	6.5	5.0	6.5	6.5	6.5	6.5	6.5	6.5	7.9	6.5	7.9	6.5	6.5	6.5
7	Between Between Runax & Runin (r	ou	yes	yes	2	OU	763	yes	768	Ves	uo	yes	yes	yes	yes	yes	уев	yes	yes	yes	no
	Codel	3-151-03	9-30L-F5	10-30R-G5	1-151-44	5-151-F5	8-30R-E2	2-15R-C4	7-30L-D4	6-30R-B3	4-15R-E2	8-30R-E2	10-308-65	3-151-03	4-15R-E2	7-301-04	5-151-85	1-151-44	9-30I-F5	6-30R-B3	2-1 5R-C4
	Run No.	1776	276	573	7776	945	9776	276	876	o76	950	951	952	953	954	955	956	957	958	959	96

For definition of code, refer to text.

S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete. 4 % Notes:

3. Useful range of Emax is 0 to 15 degrees.

102

CONFIDENTIAL

TABLE 12.4

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18° Set No. 2

Code ¹ Retween Reax Emax E			2	Dat	Data at Rmax	Xen	Date	Data at R _{min}	din	Data at Erring Point	Erin	g Point		
10-30E-G5 18	Run No.	Code	Fired Between Razx & Rain		Emax 3 (deg)	ER (deg)	Rmin (n.m.)	Emax (deg)	FB (deg)	RFire (n.m.)	Rmex (deg)	(3eg)	Remarks	Evaluation ²
4-15h-R2 yes 6.5 18 >20 3.75 7.5 >20 4.25 1-15h-At no None None None None None 2-15h-At res 6.5 17.5 4 3.5 7 4 5.2 5-15h-At res 6.5 17 16.5 3.75 7 4 5.2 8-30R-R2 res 6.5 12 10.5 None 9 5.75 9-30L-R5 res 6.5 17.5 6.5 3.7 4 5.2 9-30L-R5 res 6.5 17.5 14 3.4 6.5 18 6.3 7-30L-D4 res 6.5 17.5 14 3.4 6.5 18 6.3 1.5 4 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	196	10-30E-C5	yes	6.5	18	R	3.75		× 88	3.9	6	>30		F
1-151-A4 no None None None None None None None 2-15B-C4 Yes 6.5 17.5 4 3.5 7 4 5.2 5.2 5.2 1.5 4 3.5 7 4 5.2 5.2 5.2 1.5 4 5.2 3.7 7 1.7 3.7 3.7 5.2 5.2 1.5 1.5 4.5 1.5 1.5 1.5 1.5 4.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 4.5 1.5	962	4-15B-E2	yes	5.5		8	3.75		8	4.25	10	>20		íz,
2-15R-C4 yes 6.5 17.5 4 3.5 7 4 5.2 5-15L-F5 yes 6.5 17.5 16.5 3.75 7 17 3.75 8-30R-E2 yes 6.5 12 10.5 Mone 4.7 4.2 6-30R-E3 yes 6.5 17.5 6.5 18 15.7 4.0 4.7 9-30L-F5 yes 6.5 17.5 14 3.4 6.5 18 5.9 4.9 7-30L-F5 yes 6.5 17.5 14 3.6 8.5 14.9 4.9	696	1-151-44	22	None			None			None				R
5-151-P5 Tes 6.5 17 16.5 3.75 7 17 3.75 8-30R-E2 yes 6.5 12 10.5 None 4.7 4.2 6-30R-E2 yes 6.5 12 10.5 None 4.7 4.2 5-30R-E3 yes 6.5 17.5 9 3.7 8 11.5 4.7 7-30L-D4 yes 6.5 17.5 14 3.6 6.5 18 15.5 4.9 7-30L-D4 yes 6.5 17.5 14 3.6 8.5 1.6 4.9 9-30L-P5 yes 6.5 17.5 14 8.5 16.9 4.9 1-15R-D3 yes 6.5 17.5 15 4 8.5 16.5 5.5 2-15R-D3 yes 6.5 17.5 15 16.5 3.9 9 20.5 5.5 8-30R-E2 yes 6.5 17 18.5 3.8 <	796	2-15B-C4	уез	6.5	17.5	-7	3.5	7	-7	5.2	12.5	3		ഗ
8-30R-E2 yes 6.5 12 10.5 None 9 5 4.2 6-30R-E3 yes 6.5 17.5 6.5 3.7 8 11.5 4 9-30L-F5 yes 6.5 17.5 6.5 17.5 14 3.4 6.5 18 3.9 9 5.9 9-30L-F5 yes 6.5 17.5 14 3.6 6.5 18 9 4.7 4.9 4.7 4.9	965	5-15L-F5	yes	6.5	17	16.5	3.75	7	17	3.75	7	17		F
6-30R-B3 yes 6.5 12 10.5 None 4.7 3-15L D3 yes 6.5 17.5 6.5 3.8 8.5 11.5 4 9-30L-F5 yes 6.5 17.5 9 3.7 8 15 3.9 9-30L-F5 yes 6.5 17.5 14 3.4 6.5 1.5 4 8.5 16.3 4.9 3-15L-D3 yes 6.5 17 4 3.6 8.5 4.9 4.9 4 4-3R-E2 yes 6.5 17 14 3.6 16.5 4.9 4-15R-E2 yes 6.5 17 12 4 8.5 16.5 5.5 2-15R-E2 yes 6.5 17 18.5 3.9 9 8.5 4.7 6-3R-E3 yes 6.5 18 9 3.8 9 8.5 4.7 6-3R-E3 yes 6.5 14 9 8	35.5	8-30R-E2	yes	5.5	18	∞	3.8	6	5	4.2	10	5.5		S
3-15L D3 yes 6.5 17.5 6.5 3.8 8.5 11.5 4 9-30L-F5 yes 6.5 17.5 9 3.7 8 15 3.9 7-30L-D4 yes 6.5 15.5 14 3.6 18 6.3 3-15L-D3 yes 6.5 17 4 8.5 16 4.9 4-15R-E2 yes 6.5 17 15 15 4 8.5 16.5 5.5 2-15R-C4 no 6.4 15 >20 None 8.5 16.5 5.5 8-30R-E2 yes 6.5 17 18.5 3.9 9 8.5 4.7 6-30R-E3 yes 6.5 18 9 8.5 4.7 7 9.5 5.2 6-30R-E3 yes 6.5 14 9 None 7 9.5 5.4 10-30R-G5 yes 16 17 >20 3.25 <td< td=""><td>196</td><td>6-30R-B3</td><td>yes</td><td>6.5</td><td>22</td><td>10.5</td><td>None</td><td></td><td></td><td>4.7</td><td>8</td><td>11.5</td><td></td><td>F</td></td<>	196	6-30R-B3	yes	6.5	22	10.5	None			4.7	8	11.5		F
9-301_F5	896	3-151-03	yes	6.5	17.5	6.5	3.8	8.5	11.5	4	10	11		íe,
7-301-D4 yes 6.5 15.5 14 3.4 6.5 18 6.3 3-151-D3 yes 6.5 17 4 3.8 8 8.5 4.9 9-301-F5 yes 6.5 17.5 15 4 8.5 16.5 5.5 4-158-E2 yes 6.5 17.5 15 4 8.5 16.5 5.5 5-151-F5 yes 6.5 17 18.5 3.9 9 20 5.2 8-30R-E2 yes 6.5 18 9 8.5 4.7 7 7 7 7 7 7 7 7 7 6 20 5.4 7	696	9-30I-F5	768	6.5	17.5	6	3.7	60	15	3.9	6	15		E,
3-151-D3 Yes 6.5 17 4 3.8 8 8.5 4.9 9-301-F5 Yes 6.5 18 15.5 4 8.5 16 4 4-158-E2 Yes 6.5 17.5 15 4 8.5 16.5 5.5 2-158-c4 no 6.4 15 >20 None None 5-151-F5 Yes 6.5 17 18.5 3.9 9 >20 5.2 6-30R-E2 Yes 6.5 17 >20 3.8 9 8.5 4.7 10-30R-G5 Yes 6.5 17 >20 3.25 6.5 >20 5.4 7-301-D4 no 6.5 15 >20 None None 5.3 1-151-A4 Ves 6.4 15 >20 None 5.3	026	7-30L-D4	уев	6.5	15.5	77	3.4	6.5	18	6.3	15	14.5		Ŋ
9-301_F5 Tes 6.5 18 15.5 4 8.5 16.4 4 4-15R-E2 yes 6.5 17.5 15 15 4 8.5 16.5 5.5 2-15R-C4 no 6.4 15 >20 None None 5.5 5-15L-F5 yes 6.5 17 18.5 3.9 9 >20 5.2 6-30R-B3 yes 6.5 18 9 3.8 9 8.5 4.7 6-50R-B3 yes 6.5 14 9 None 7 9.5 5 10-30R-G5 yes 6.5 17 >20 3.25 6.5 >20 5.4 7-30L-D4 no 6.5 16 18.5 3.25 6 >20 3 1-15L-A4 ves 6.4 15 >20 None 5.3 5.3	977	3-151-03	yes	6.5	17	4	3.8	€0	8.5	6•4	ន	9		ഗ
4-15R-E2 yes 6.5 17.5 15 4 8.5 16.5 5.5 2-15R-C4 no 6.4 15 >20 None None None 5-15R-C4 no 6.4 15 >20 None 5.2 None 6-3GR-B2 yes 6.5 18 9 3.8 9 8.5 4.7 6-3GR-B3 yes 6.5 14 9 None 7 9.5 5 10-3GR-G5 yes 6.5 17 >20 3.25 6.5 >20 5.4 73GL-D4 no 6.5 16 18.5 3.25 6 >20 3 1-15L-A4 ves 6.4 15 >20 None 5.3 5	972	9-30I~F5	yes	6.5	18	15.5	4	8.5	16	4	8.5	16		F
2-15B-C4 no 6.4 15 >20 None None None None None None None None None 5.2 1 1 1 1 2 3.8 9 8.5 4.7 1 3 3.8 9 8.5 4.7 1 3 4 7 1 3 4 7 1 3 3 8 8.5 4.7 1 3 4	23	4-158-E2	yes	6.5		1.5	4	8.5	16.5	5.5	13.5	1.5		E.
5-151-F5 yes 6.5 17 18.5 3.9 9 >20 5.2 1 8-30R-E2 yes 6.5 18 9 3.8 9 8.5 4.7 1 6-30R-E3 yes 6.5 14 9 None 7 9.5 5 1 10-30R-G5 yes 6.5 17 >20 3.25 6.5 >20 5.4 1 7-30L-D4 no 6.5 16 18.5 3.25 6 >20 3 1-15L-A4 yes 6.4 15 >20 None 5.3 1	476	2-15B-C4	2	7.9		>20	None			None				F
8-30R-E2 yes 6.5 18 9 3.8 9 8.5 4.7 1 6-50R-B3 yes 6.5 14 9 None 7 9.5 5 5 10-30R-C5 yes 6.5 17 >20 3.25 6.5 >20 5.4 1 7-30L-D4 no 6.5 16 18.5 3.25 6 >20 3 1-15L-A4 yes 6.4 15 >20 None 5.3 1	975	5-151-F5	yes	6.5	17	18.5	3.9		>20	5.2	13.5	1.9		ē
6-30R-B3 Yes 6.5 14 9 None 7 9.5 5 10-30R-G5 Yes 6.5 17 >20 3.25 6.5 >20 5.4 1 7-30L-D4 no 6.5 16 18.5 3.25 6 >20 3 1-15L-A4 ves 6.4 15 >20 None 5.3 1	37.6	8-30R-E2	yes	6.5	18	6	3.8	6	8.5	4.7	12.5	8.5		S
10-30R-G5 yes 6.5 17 >20 3.25 6.5 >20 5.4 7-30L-D4 no 6.5 16 18.5 3.25 6 >20 3 1-15L-A4 ves 6.4 15 >20 None 5.3	226	6-30R-B3	yes	6.5	17	6	None	7	9.5	5	8.5	8.5		S
7-301-04 no 6.5 16 18.5 3.25 6 >20 3	826	10-30R-G5	yes	6.5		8	3.25		28	5.4	13	>20		ď
1-151-44 ves 6-4 15 >20 None 5-3	62.6	7-301-D4	01	6.5	16	18.5	3.25		>20	3	5	>30	Fired 0.5 sec. After Rain	ſ2 ₁
	980	1-151-44	yes	7.9	15	>20	None			5.3	75	720		ÎZ,

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 4% Notes:

3. Useful range of Emax is 0 to 15 degrees.

CONFIDENTIAL

103

TABLE 12.5

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 18^o Set No. 2

, p		7	Dat	Data at Rmax	X	Dat	Data at Rmin	ún	Data at Firing Point	Firing	Point		-
Codel between Rmax Rmax Rmax & Rmin (n.m.)	en Rmax Rmin (n.m.)			Emax (deg)	(Sep)	Rmin (n.m.)	(gep)	(ਡੰਬp) ਖੰਬ	RFire (n.m.)	Emax (deg)	Ra (deg)	Remarks	Eva luation ²
7-30I-D4 no 6.5	₩ ₩	6.5		14.5	, S	None	,		None				(E,
yes	-	6.5		ĺ	\ S S	3.75	8	18.5	4	8.5	18.5		Ckq
no.		None				None		-	None				(æ.
9-30L-F5 yes 6.5	-	6.5		17.5	6	3.8	80	12.5	5	12.5	10.5		S
3-151-D3 yes 6.5	-	6.5		18	1.5	3.9	80	77	2.4	12	3.5		လ
-	-	5.5		87	9.5	3.75	6.5	∞	4.5	9.5	₩		. 5
no 6.5	6.5	├		18	11.5	3.9	8.5	16.5	3.6	8	17.5	Fired O.4 sec.	Œ
5-151~F5 yes 6.5	6.5	-	L	17	8	3.75	8	220	5	12	>20		(±,
	 	6.5		21	€0	None			None			Could Have Fired	(ž.)
4-15R-E2 yes 6.5	6.5	┝	Ľ.	17	18.5	3.9	. 8	>20	5.2	13	>30		F
yes 6.5	6.5	-		14.5	×20	None			5	6	>20		Çe.,
-	-	6.5	L-	16.5	~	4.7	2	2.5	5	11	7		ഗ
7-30L-Dit yes 6.5	\vdash	6.5		17	19.5	6	7	250	4.5	6	R		Çe,
9-30L-F5 yes 6.5	-	6.5		17	9	3.8	2	3.5	. 5	11.5	0.5		ဟ
уез	-	6.5		17	18	3.9	8	200	4.5	ឧ	>30		E.
		6.5		17	9	3.9	₩	7	3.6	7	7.5	Fired 0.5 sec. After R _{min}	ŭ
10-30R-G5 yes 6.4	-	4.9		17	×2	3.2	9	<u>م</u>	5.2	77	>30		4
2		None				None			None				Ŧ
8	80	6.5		7	11.5	None			4.3	6	>20		[æ,
8-30R-E2 no 6.5		6.5		18	9.5	7	6	6	3.5	2	6	Fired 0.7 sec.	ű,
						1							

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 4 % Notes:

3. Useful range of Emax is 0 to 15 degrees.

TABLE 13

Summary of Results

Attack-While-Search Mode Deviated Pursuit, Lead Angle 250

1-15R-44, 2-151-C4, 3-15R-D3, 4-151-E2, 5-15	1 200 100			-			
e to 6 1 4 10 e to 6 1 4 10 e to 6 1 4 10 fire 1 4 10 fire 10 10 10	-15R-D3 4-15L-B2 5-15R-F9	5 6-30L-B3	7-30R-D4	8-30L-E2	9-3CR-F5	10-301-G5	Totals
e to	0	9	2	9	2	0	39.
e to e to fire sible logouth fire logouth fire logouth fire logouth fire logouth fire logouth fire logouth logou	01	3	2	7	7	10	.57
Fire 1 10 10 10 10 10 10 10		ч	rt			,	N
1 10 10 10 10 10 ses	`						
10 10 10 10 10 ses					τ		2
0 2 3C See	10	10	10	10	10	10	001
	0 0 2	€0	3.0	7	9	0	53

Total No. Valid Runs = 100 Total No. Successes = 39

Total No. Potential Successes if Fired at Rmax = 5

at Rmax & Success = 39% % Fotential Success = 53%

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 1

	Evaluation ²	F	વિ	(E.	တ	Ē.	S	íŁ,	(te.,	E4	Ge.	F	S	S	F	S	S	ſæ,	S	4	œ,
	Remarks		Did Not Fire						Fired 0.2 sec. Before Rmax		Fired .5 sec. Before Rmax	,									
Firing Point	R. (deg.)	16		15.8	12	>20	8	280	19.5	18.5	14.5	×20	12.2	71	5*8 T	0.7	2.5) (20)	30.5	16.5	^ 2S
Firing.	Emax (deg)	97		11	12.5	13.5	12	0.6	20	16.5	16.5	17.5	15	1.4	15	1.5	10.5	18	51	•5	13
Data at	$_{(n_{\bullet}R_{\bullet})}^{R_{\Gamma_{1}\Gamma_{0}}}$	3.8	None	4.2	5.1	4.7	5.0	0*7	6.5	5.4	6.4	5.5	5•5	5.4	5.5	2.5	8•4	6.5	6.3	5.3	5.2
űn	ਸ਼ੁਸ਼ (ਉමਨ)	16.4		18.5	12.5	>20	9.5		>20	>20		×8	13	8.0	>20	77	1.8	>20		×20	<u>م</u>
Data at R _{min}	Emax (deg)	0.6		7.0	6.5	8.5	٥٠ <u>/</u>		8.5	8.5		8.0	8.0	0*8	0*9	0.9	3.8	0°5		5.4	80
Dat	Rain (neme)	3.75	None	3.6	3.5	3.6	3.5	None	3.8	3.7	None	3.7	3.75	3.7	3.3	3.6	3.0	3.0	None	3.75	3.5
ж	ER (gep)	15.3	17.5	7.9	10.2	220	7.1	>20	19.5	18	14.9	82	11	15	16.5	0•2	1.4	8	20.5	13.5	× کې
Data at Rmax	$\epsilon_{\max_{\mathcal{E}}}^{\mathrm{Fmax}}$	5°6T	10.5	19	16.5	19	77	16	19	19.5	15.0	18.5	18.5	15	18.5	16.5	14.5	18	15	18	18.5
Dat	Rmax (n•m•)	η•9	6.5	6.3	6.3	6.3	6.3	7.9	6.5	6.5	6.3	6.5	6.5	€*9	5*9	7.9	7.9	6.5	6.3	6.5	7.9
	fired Between Rmax & Rmin	yes	ou	yes	уез	yes	yes	Ves	ou	ves	Ou	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Codel	8-30L-E2	1-15R-AL	2-158-03	2-151-C4	10-301-05	7-30B-D4	5-15R-F5	4-151-E2	9-30B-F5	6-301-B3	4-151-E2	3-15R-D3	2-151-C4	8-30L-E2	7-30R-D4	1-15R-44	10-301-65	6-30I-B3	9-30R-F5	5-15R-F5
	Run No.	1001	1002	1003	7001	1005	1006	1007	1008	1009	1010	101	1012	1013	1014	1015	1016	1017	1018	1019	1020

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 나성 Notes:

3. Useful range of Emax is 0 to 15 degrees.

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 1

	Evaluation ²	E.	[24	je,	F	S	S	8	F	Œ,	S	F	S	3.	(tr.	स	S	S	Ŧ	4	Ĺτι
	Remarks		Fired 0.5 sec. Before Rmax									Dian t rire			Fired 0.4 sec. Before Ruaz	-					Fired 0.9 sec. Before Rmax
g Point	Ra (deg)	18	>20	>20	>20	5.6	11.5	3.5	>20	17	4.5		12.2	5.5	8*6	>20	14.3	14.9	>20	>20	3.0
Data at Firing Point	Emax (deg)	17.0	19	17.5	0.4	19.0	15.5	1,4	18	10	14	: - 	15.5	7.0	16	17	1.5	17	14.0	14.5	1.7
Data at	RFire (n.m.)	0•9	9*9	6.2	3.6	6.5	5.5	9*5	6•3	5.9	5.3	None	[*9	5.8	9*9	6.2	5.5	5.5	5.2	5.5	7.0
tin	(geb)	× 20		200		5.4	16	2.0	>20		0*7	>20	4.5	8.5		\ 02<	17	>20	>20	>20	1.0
Data at Rain	Emax (deg)	8.5		8.5		6. 5	8.5	0*9	7.5		5*8	5	8•0	0.6		0*6	8.5	7.5	0°2	0*8	7.0
Dat	Rmin (n.m.)	3.75	None	3.8	None	3.75	3.75	3.6	3.6	None	6•€	2.3	3.7	3.75	None	3.7	3.75	3.6	3.6	3.6	3.6
ж	BR (deg)	17.5	>20	×28	83	5.6	10	0•47	\$ 8	16	5.5	19	12.8	5.1	10.8	×8	7.7	12.8	≥20	200	3.2
Data at Rmax	Emax (deg)	19	18	18	7.7	139	18.5	16	18.5	12	19	14	91	19	15	18	18	19.0	19	18.5	15
Dat	Rmax (nome)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	4.9	7.9	6.3	6.5	6.5	6.5	6.5	6.5	6.5	6.5
,	Fired Between Emax & Emin	yes	00	yes	yes	yes	yes	yes	yes	yes	yes	ខ	yes	yes	ou	yes	yes	yes	yes	yes	ou
	Codel	9-30R-F5	10-30L-G5	4-151-E2	1-15R-A4	2-151-04	3-15R-D3	7-30R-D4	5-15R-F5	6-30I-B3	8-30I-E2	1-15R-A4	2-15I-C4	8-30L-E2	6-30L-B3	5-15R-F5	9-30R-F5	3-15R-D3	4-151-E2	10-301-G5	7-30B-D4
	Run No.	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040

For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete. . 2 Notes:

3. Useful range of Emax is 0 to 15 degrees.

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 1

		25		Data at Rmax	ж	Dat	Data at Rain	in	Data at	Firing	Firing Point		
Run No.	Cociel	Betweer. Raax & Rmin (Pmax (n.m.)	Emax ³ (deg)	ER (deg)	Radin (neme)	Emax (deg)	MR (deg)	RFire (n.m.)	Emax (deg)	(국eb)	Remarks	Evaluation ²
1701	3-15R-D3	yes	6.5	18.5	4.6	3.8	8.5	16.5	0.9	16.5	10.5		Ø
1042	9-30R-F5	yes	6.5		>20	3.8	8.5	^ ج	5.8	17	82		(st.)
1043	10-30L-G5	yes	6.5	18	16.8	0*4	€.5	\ 02<	4.4	10	19.2		E4
1044	1-15R-A4	yes	7.9	17	10.1	2.5	4.5	18.8	4.3	0.9	15		æ
1045	5-15B-E5	yes	6.5	17.5	№	3.2	5.5	8	5.5	12.5	× ×		e.
1046	8-30L-E2	yes	7.9	6 <u>.</u>	10.5	3.75	8.0	16.2	4.5	11.5	14.2		Ce.
1047	2-15L-C4	yes	7.9	6T	11.2	3.75	0.6	15.1	0•4	0.6	6.41		(Se)
1048	7-30R-D4	yes	5.9	18	5.2	3.75	7.0	11.5	5.0	12	10		κΩ
1076	6-30I-B3	yes	6.5	13.5	7.5	2.5	0.4	>20	5.4	0.6	0°2		S
1050	4-151-E2	ou	6.5	87	18.5	3.8	0.6	>20	3.4	0*9	>20	Fired 1 sac. After Pain	ولأ
1051	8-30F-E2	yes	7*9	19	1.5	3.9	9.0	0.8	4.4	12	7.1		S
1052	10-30L-G5	yes	6. 5	18.5	×8	3.6	0.7	88	5.5	16.5	83		ST.
1053	3-15R-D3	yes	6.5	19	21	3.8	0.6	>20	4.5	10	×80		íz,
1054	4-15L-E2	yes	5*9	18	17.2	0.4	8.0	18	0.9	15.5	17.2		<u>1</u> 24
1055	7-30R-D4	yes	6.5	16	3.41	3.25	5.5	>20	5.2	11.0	02<		લ
10%	5-15R-F5	yes	5.5	18.5	>20	3.7	8.0	>20	5.5	14.0	02<		ž.
1057	1-15B-A4	yes	6.5	15	5*6	2.5	4.5	>20	6.2		11.5		S
1058	9-30R-F5	yes	6.5	5	5•41	3.8	8.0	>20	5.5	14.5	16.5		(E4
1059	6-301-B3	yes	6.5		>20	None			9*4	9.5	>20		ध
1060	2-15I-C4	yes	6.5	17	5.0	3.7	0*2	9*0	0*9	15	1.0		Ø

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. નં લં Notes:

3. Useful range of Emax is 0 to 15 degrees.

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108

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TABLE 13.4

Results of Simulation

Attack-While-Search Mode Evsluation Deviated Pursuit, Lead Angle 25° Set No. 1

	on ²			7	Ī	T																	
	Evaluation ²	ČE,	[24]	5.,	(7)	24	S	S	co.	(Eg	κλ	[24		<u>.</u>		124	S	ſz.	Cz.,	တ	Œ,	(24	'n
	Feranks			Didn't Fire									Did Not Fire	When	Permissible							Didn't Fire	
Point	हिं (deg)	>20	17.5		6.5	38	10.2	8.5	11	12.5	8.6	16.5				>30	11.2	320	12.5	10.1	\ \ \		7.9
Firing	Emax (deg)	77	13.5			0.6	14.5	13	15	10	\mathfrak{U}	10				15	12	16.5	10.5	15	11		12.0
Data at Firing Point	RFire (n.m.)	5.5	5.5	None	4.2	403	5.2	5.7	5.3	4.5	5.5	4.04		None		5.4	8•4	5.5	4.3	6.5	0 \$	None	7.5
in	ER (deg)	>20	>20		8.2	>20	11.8	13.7	13	11.0	13	15.5		8•0		3	12	8	13.5		\$3	8	8.2
Data at R _{min}	Emax (deg)	0.8	8.0		5.5	5.5	0*8	4.2	0.8	7.0	0.9	0.7		8.0		8.0	O. ⊗	16	2.0		0 .8	0.9	4.5
Date	Rain (nome)	3.6	3.8	None	3.6	3.2	3.75	2.9	3.75	3.8	3.7	3.9		3.8		3.75	3.7	3.75	3.75	None	3.8	6	3.5
ax	Bh (deg)	>30 >30	91	>20	0.4	×80	16.5	7.8	6	8.5	7.5	17		7.5	_	× ×	12	>20	9.5	10.1	8	>15.1	7.3
Data at Rmax	Emax (deg)	18	17.5	1.5	17.5	17.5	18	15	18	17	15.5	87		17		18	17	18	18	15	18	16	14.5
Dat	Rmax (n.m.)	6.5	6.5	6.5	6.3	6.3	6.3	6.5	6.5	6.5	7.9	7.9		4.9		7.9	6.3	6.5	6.3	6.5	9.5	7.9	6.5
	Fired Between Smax & Rmin	ves	yes	ou	yes	yes	ves	Ves	ves	ves	Ves	ves		21		ves	Ves	ves ves	Ves	ves	Ves	2	7es
	Code ¹	30-301-65	4-151-E2	1-15B-A4	2-151-C4	5-13B-FF	8-30L-E2	6-301-B3	3-15R-D3	9-30R-F5	7-30H-DL	3-15B-D3		9-30R-F5		4-151-E2	2-15I-C4	5-15R-F5	8-30L-E2	6-30I-B3	10-201-65	7-30R-DL	1-15B-A4
	Run No.	1061	1062	1063	1064	1065	1066	1067	1068	10/3	10.70	ונטר	1	1072		1073	1074	1075	1076	770	1078	52.01	1080

Motes: 1. For definition of code, refer to text.
2. S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete.

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^{3.} Useful range of Engx is 0 to 15 degrees.

TABLE 13.5

Results of Simulation

Attack-Wnile-Search Wode Evaluation Deviated Pursuit, lead Angle 25° Set No. 1

_				- ₁							_	τ~	1	~7~	7	~7	~т	T	7	7	7	7		7		}
		Evaluation	U	2 4	3	£1	Eq.	Œ.	CE,	S	S	(z	. 0	310	2.1	cs.	Es,	S	S	[k ₁	לט	E.	į.,	S	8	
		Remarks			14	ndn t rre	When Permissible					-														
+ 5	torne.	Eg (deg)		77	82			8	19.5	0.7	2 2	7.5	₹ <u>`</u>	10.5	19.2	8.0	28	0.7	10.8	126	10.7	120	\ \ \ \ \ \ \	9.6	5.0	
2	Data at firing round	Gaeg)		16	174			13.5	1			1002	70	7	13	15.5	01	12	15.5	15.5	15.5	15.5	10.0	101	14.5	
	Data at	RFire (n.m.)		6.1	5:3		None	5.1	6 3	100	7.0	2.4	8.7	3.1	5.0	19.5		2.5	2.5	5	12	2	197	2.5	1	
_	in	Eg (deg)		_	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		16.5	5	366	3	?	9.5			8	15.5		37	70	15.0	707	000	33/		6.0	2
	Data at Ruin	Emax (deg)		0.9	8.0		4.5	7	-1		0.8	ထိ			0	0	3	200			000	0 0	1		0	0
	Dat	Rmin (neme)	- 37	3.5	3.75		3.25	-	200	30.15	3.75	3.75	None	Mone	2002	200	-	200		0	7	7.00	3.67	None	None	7.67
	K X	ER (deg)	.0	10.9	120	3	3.5		22	8	0,0	4.5	120	2	10	87	٥.٧	19.9	200	2	97	70.7	22	25	٥٠	0.0
	Data at Amax	Enax (Jage)	60,2	7 7 7	10 5	.0.	14.5		78	18	18.5	2.0	0	07	2	1.05	177	18	15.5	18	87	8.5	139	12.5	2	18
		Raax	/110mm	6 7	200		6.4		6.3	6.3	6.3	2	5 7	2	3	6.25	7.9	6.3	6.4	6.25	63	6.3	6.3	7.9	6.5	7.9
-		Fired Between	nmax of nmin		res	yes	ou		yes	yes	YPS	200	750	yes	yes	yes	yes	yes	yes				yes	yes	yes	yes
		Code			7-30R-D4	10-30L-G5	1-153-44		9-308-F5	2-15R-03	2 121 0	2-172754	2-301-6	5-15R-F5	6-30I-B3	4-151-E2	2-151-C4	5-15R-P5	7-30R-D4	9-30R-F5	4-15I-E2	3-158-03	10-301-05	1-158-44	6-30I-B3	8-301-E2
		Run			1081	1082	1083) } }	100	1005		2821	1087	1088	1039	1090	1007	1092	100.5	7631	:095	1096	1007	1098	1099	1100

Useful range of Emax is 0 to 15 degrees. %

For definition of code, refer to text.

S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete. 44 Notes:

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TABLE 13.4

Results of Simulation

Atteck-inile-Search Mode Evaluation Deviated Pursuit, lead Angle 25° Set No. 1

	,	Evaluation ²	FI	4	+	+	3	, 0	2	2	S	£4,	S	[2. ₁	6	fs.	ĝs.,	S	Ĭz.	12.7	ez.			o;
		Remarks			Didnot Bine	STT STITE									PATE NOT THE	When							Didn't Fire	
	Point	(gep)	\ \ \ \ \ \ \	17.5	100	1	200	Š.	10.2	8.5	T	12.5	8.6	16.5			× ×	11.2	28	12.5	10.1	22		C
}	Data at Firing Point	Emax (deg)	14	12 E	2		3	2	14.5	13	ដ	2	2	97	-		15	75	16.5	10.5	15	Ħ	_	6
	Data at	RFire (n.m.)	5.5	2	3	Morrie	4.5		5.2	5.7	5.3	4.5	5.5	4.4		None	5.4	8-7	5.5	4.3	6.5	5.0	None	-
	in	語 (deg)	23	200	3		8.2	& &	11.8	13.7	13	14.0	13	15.5		0.8	8	12	8	13.5		280	220	3
	Data at R _{min}	Emax (deg)	0 0		Ç.		5,5	5.5	0	4.2	⊙	2.0	0.9	7.0		8.0	0	0.0	116	2.0		2.0	10.9	3
	Date	Amin (n.m.)	3.6	200	200	None	3.6	3.2	3.75	2.9	3.75	3.8	3.7	12		3.8	2.75	100	3.75	3.275	None	8.5	2,2	7.
	ах	ER (deg)	5	3	7)7	>20	7.0	>20	16.5	7.8	0	3 0	7.5	100		7.5	8	20	200	9.5	10.1	S	17.5	7-7-7
	Data at Rynax	Emax (deg)	6	27	17.5	15	17.5	17.5	18	75	a	13	77.5	201	2	17	9	315	× -	a C	15	100	77	07
	Dat	Raux (n.m.)	- 11	Ç.0	6.5	6.5	6.3	6.3	6.3	2.5	1	7 2		1	3	7.9	7.7	100	2 4	100	7	2 4	5	7.00
		Fired Between Emax & Emin		yes	yes	25	yes	Yes	Ves	2692	200	200	355	753	y 85	o u		Yes	700	COA.	200	753	200	013
		Code		10-301-65	4-151-E2	1-15R-A4	2-151-CL	5-1 5B-P5	9-301-ES	28 10c 7	2 150 72	3-17m-33	7-500-F2	1-200-104	シーエンボールン	9-30R-F5	77.	X2-77-17	2-121-24 5 75 75	0 201 F2	2007	20100-0	10-100-01	1-304-114
		Run No.		1061	1062	1063	1001	1065	7201	270	7007	2007	7007	201	107	1072		200	17/07	7001	2000	2007	2007	62.01

For definition of code, refer to text.
S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete. 4 % Notes:

Useful range of Enax is 0 to 15 degrees. 33

Summary of Results TABLE 14

httack="Mile-Search Mode
Deviated Pursuit, Lead Angle 250
Set No. 2

Code	1-151-44	2-15R-C4	3-151-D3	4-15R-32	2 5-15L-F5	6-30R-B3	7-30L-D4	8-30R-E2	9-30L-F5	1-15L-44 2-15R-C4 3-15L-D3 4-15R-32 5-15L-F5 6-30R-B3 7-30L-D4 8-30R-52 9-30L-F5 10-30R-G5 Totals	Totals
Successes		5	H		·		*	73			.12
Failures One to Launch Heading Errors	10	5	ċ	10	10	10	. ح	. 7	6	10	85
Failures Due to Firing Before Rmax										,	
Failures Due to Firing After P _{mi} n								·	-		r-4
Failure to Fire When Permissible							r	۲.			8
Total. Runs Made	ot.	10	0	10	01	OI.	27	21	10	10	100
Potential Successes If Fired at E _{max}	2	¢o				7	80	9	2		33

Total No. Valid Runs = 100
Total No. Successes = 12
Total No. Potential
Successes = 33

Fercent Success = 12 Fercent Potential Success = 33

TABLE 14:1

Regults of Simulation

Attack-Whils-Search Mode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 2

, , , , , , , , , , , , , , , , , , ,	Date	Data at R _{max}	ax	Dat	Data at R _{min}	nin	Data at Firing Point	Firing	Point		
	Rnax (neme)	Emax (d3g)	ER (deg)	Rain (n.m.)	Emax (deg)	BR (geb)	RFire (n.m.)	Emax (deg)	ER (deg)	Hemarks	Evaluation ²
	6.5	18	F	4	6	10.5	-4	6	10.5	,	P
	7.9	13	8	None			5.5	8.5	19.5		F
	5.5	18	R	3.7	7	>20	4.€	9	>20	Fired 0.4 sec.	Ħ
	6.5	18	5.5	7	8	4.5	4.3	10	4.05		S
4	6.5	138	82	3.8	60	>30	4.5	π	>20	Fired 3.7 sec.	ᆦ
	6.5	17	6.5	3.75	2	19.5	2.5	2.5	>20		Ŧ
1	6.5	15	>20	None		!	4.7	10	>30		Œ
1	6.5	18	82	3.6	7.5	>30	2.5	7.5	>20		F
<u> </u>	6.5	18	×20	3.75	8	>20	5•4	11.5	200		Ĺ¥.,
	6.5	77	13.5	None	-		5•4	7.5	18.5		ſz.,
1	6.5	17	19.5	3.9	8	×8	5	13	×20	-	ĈŁ,
	6.5	17.5	17.5	3.7	5	Š	4.5	8	ξ		Çe,
<u> </u>	6.5	17.5	7.5	3.7	4	8.5	5.2	113	8.5		ഗ
Щ.	6.5	17.5	16	4	8.5	1.5	4	8.5	15		E4
ļ.,	6.5	16	₩	3.75	5.5	10.5	6•4	_ 6	8.5		ક
	6.5	13	>20	None			None				(24
_	∂• 5	17.5	>20	3.6	5	>20	4	7	>20		Œ,
_	6.5	75	8.5	3.	4	17	5•€	5	10		j2.,
_	6.5		>20	3.9	9	×8	4.5	9.5	×8		íta,
	6.5	17	×20	3.9	5	8	7-4	2	8		ſz,

Motes: 1.

For definition of code, refer to text.

S - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete.

TABLE 14.2

Restits of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 2

	Evaluation ²	Į.	Œ,	٤.	(tr.	F	ſz,	S	Eq.	Ą		Ā	Œ.	íz.	[e.	Ce.,	F	į.	œ,	F	S
	Remarks	,			Fired Outside Rmax					Fired 1.4 sec. Before R _{max}			Fired 0.4 sec. Before Rmax	Could Have			Fired 0.9 sec. After Rmin				
Point	(3ep)	14	8	>30	>20	10	>30	-7	Š.	14.5	11.5	13	×80		77	>20	15	>20		>20	5.5
Firing	(geb)	91	Ħ	13.5	11	7	T	3.5	άr	13.5	7	12	14.5		₩	27	5	12.5		2	8.5
Data at Firing Point	RFire (n.m.)	4.5	2	5.2	3.2	77	2-7	4.5	77	7	-7	5.5	8.9	None	8.4	4.5	3.5	5	Nore	4•3	4.07
nin	Ry (gev)	15.5	×28	28		10	Š	9	\$ \$		11.5	10.5		77		.02	13.5	>20	>20	\ \ \	5
Jata at Emin	Emax (deg)	7	7	~		9	2	٥	7		2	-#		60		7	7	∞	8	9	9
Jat	Rmin (neme)	3.9	4	77	None	3.9	3.9	3.8	3.8	None	-#	2.8	None	7	None	3.8	3.9	-7	3.9	-7	3.8
ВХ	En (deg)	13.5	16.5	×20	>20	9.5	28	7	280	14.5	6.5	77	>30	8.5	7.5	>20	8.5	16	\ \ \	200	10.5
Data at Rmax	Emax (deg)	17	16	17.5	10	15	16	132	17	17	17	17	13	17	3	17	16	18	7.7	15	16
Dat	Rmax (nem.)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
i	Between Raax & Rmin	yes	yes	yes	ÇŲ	yes	yes	yes	yes	ou	yes	yes	no	or	yes	785	ou	yes	2	yes	yes
	Code	9-30I-F5	10-30R-G5	L-1 5R-E2	1-151-44	2-17R-C4	3-151-03	7-30L-D4	5-151-F5	6-308-B3	8-30R-E2	1-151-14	2-15R-C4	8-30R-E2	6-30R-B3	5-15L-F5	9-30L-F5	3-15L-D3	4-15R-E2	10-30R-G5	7-301-D4
	Run No.	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	3137	1138	1139	0,11

Useful range of Emax is 0 to 15 degrees.

For definition of code, refer to text.

3 - The missile is successfully launched.

F - An attack failure occurs.

I - Run is incomplete. 4% Notes:

TABLE 14.3

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 2

						_			_					_	_		_			_	
	Evaluation ²	(æ,	Çe,	Œ,	Œ,	14	ĵs,	တ	ja,	F.,	ĽŁ,	F	Œ,	F	F	Ĭt,	(e.,	Œ,	F	ſĿ,	S.
	Remarks						Fired 1.7 sec. After Rmin									Could Have Fired		-			
Data at Firing Point	(geb)	× ×	<u>م</u>	>20	10	28	15.5	10	16.5	16.5	>20	> 20	> 50	80	> 20		>20		> 20	ج م	2
Firin	Emax (deg)	6	H	7	6	∞	17	10	7.5	7	8	6	9.5	9.6			7.5		10	3.5	75
Data at	RFire (n.m.)	4.5	4.8	3.8	4.8	9*4	3	4.8	4.5	4.5	4.3	7	4.3	4.3	ř	None	5	None	4.5	4	5
nin	Eg (geb)	>20	8	220	17.5	280	1.5	133	19	18	200	8	720	88	>20	16.5			\ \		5.5
Data at Amin	Emax (deg)	9	9	7	5	5	∞	9	2	77	2	2	٦.	∞		6.5			7		2
Dat	Rmin (n.m.)	3.8	3.8	3.8	3.4	3.6	4	3.6	3.4	2.5	3.9	3.9	-4	3.8	3.9	3.75	None	None	3.9	None	7
nax nax	라 (gep)	8,	ଷ	8	8.5	SX SX	16.5	5.5	8	777	৪	×20	8	10.5	82	5	>20		>20	>20	8
Data at Rmax	Emax (deg)	71	17	16.5	14.5	97	17.5	76	35	12	17	1.6	17	17		16	ភ		17	13	17
Dat	Rmax (n.m.)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6•5	None	9.9	9*9	6.5
, i	Fired Between Rmax & Rmin	ves	Ves	yes	yes	yes	on O	ves	Ves	768	yes	yes	yes	yes		ou	yes	ou	yes	yes	yes
	Codel	3-15L-D3	9.30I-F5	10-30R-G5	1-151-A4	5-151-F5	8-30R-E2	2-15B-CL	7. 3CL-D4	6-30R-B3	1.5R-132	8-30R-E2	10-30R-G5	3-151-03	4-15R-E2	7-301-D4	5-15L-F5	1-15I-A4	9-301-F5	6-30R-B3	2-15R-C4
	Run No.	1163	2711	1113	777	1175	3777	2711	1148	6771	11.53	1151	1152	1153	12.54	11.55	1156	1157	1158	1159	0911

For definition of code, refer to text.

S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete. 4 % Notes:

3. Useful range of Emax is 0 to 15 degrees.

TABLE 14.4

Results of Simulation

Attack-While-Search Mode Evaluation Deviated Pursuit, lead Angle 25º Set No. 2

72						T	1		T	-	1	1			-		_		T	T	T			
	Svaluation ²				î.	(E)	24	2.4	**	٠, }	٠.	S	12,	ı	-	S	2,	2	-	, 12	.	i, i	•	
		g Ag		-			_							-	-	-	-	-	+		+	-	-	
		Kemerks																-		1				
	.	Ren		1					_	_	_	-	-	-	1	+	+	+	+		_			
Point		BR (deg)		35	(S)	10.5	8	12	8	19.5	19	œ	120	02	7	22/0	200	32	c.	13	28	13.5		
Data at Firing Point		Emax (deg)		215	4	8.5	1.	80	12	أرم		0	1	10	0	30	250	1	1305	æ	15	6.	_	
Data at		Rivire (n.m.)		4-0	400		14.5	7	5.2	7.5	27	1	201	-	-4-	400	7057	^	5.5	4.5	5.6	4.5	None	
	E P	Ha (gep)	-	8	25	30.4	18	100	*	500	300	3	77	3	13	82	00	8	9	-	230	177	200	1
10	Data at the	Emax (deg)		9	2	i	2	olt		1	_ 2		٥	8	00	~	7	∞	89		α	2	1	`
4	Date	Rain (neme)		3.9	3.7	Norse	7	3.(2	‡	None	2.0	77	3.75	-:i	-7	3.9	3.8	3.9	4.0	Mone	200	2 6	2 0	7
+	XX	Ha (gep)		28	×20		27	25	17	>20	11.5	15.5	2	8	82	82	2	025	0.5	100	1	32	3	
	Data at Rmax	Emax (deg.)		13	18		17	78		Ì	18		16	18	18	17	16	ά	201	010	7	22		-
	Data	Rmax	\square	6.5	6.5	None	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7 2	3		2	6.5	0.0	7
		en Ben	1	o q	ves	yes	yes	yes	yes	Yes	ves	Ves	Sen	2000	700	300	300	250	yes	yes	yes	yes	yes	
ļ		Code		שט פעני ענ	10-20-02-02-02-02-02-02-02-02-02-02-02-02	77-151-1	2-158-CL	5-751-F5	A-30R-E2	(-30R-B3	2 151-13	O SOT PR	1000	200000	20075	7-301-17	200	Z-1211-04	5-151-45	8-30R-E2	6-308-B3	10-30R-35	7-301-D4	
		Bun No.			100	2021	124	1165	777	471	1169	971	202	27	1171	1172	11.13	1174	1175	1176	1177	1178	1179	

3. Useful range of Emax is 0 to 15 degrees.

For definition of code, refer to text.
S - The missile is successfully launched.
F - An attack failure occurs.
I - Run is incomplete. 4 % Notes:

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115

TABLE 14.5

Results of Simulation

Attack-While-Search Wode Evaluation Deviated Pursuit, Lead Angle 25° Set No. 2

				-	_	_	- 1	_,		_				7	- i	-	-7	_		_	
	Evaluation ²	(te.)	œ,	ís,	[24	တ	<u>[</u> 24	S	F	F	æ	Ce.	F	β 2.,	ß.	Œ,	Ge,	Ce.,	[E4	F	(e ₁
	Remarks										Fired O.6 sec. After Rain	Fired 0.8 sec.	,		-						
Point	ER (deg)	श्च	19•5	17.5	>20	14.5	15	3.5	>30	R	08<	>20	×20	×20	×80	×80	82	250	×80	0 2 X	œ,
Firing	Emax (deg)	10.5	12	7		17.5	10	15	13	10	2	9	12.5	8.5	11.5	8	77	П	13.5	7	12.5
Data at Firing Point	RFire (n.m.)	5,1	5.3	6•4		9	6*7	5•5	8*4	8*77	3.6	3.4	5.8	£•3	8*5	5*4	9	5.5	7.9	2	9
nfin	BR (deg)	>20	280		>20	14	91	2	×80		×8	ୡ	×30	>30	>30	×8	>30	>20	>30		>20
Data at Rmin	Emax (deg)	5.	8			8	4	6	6		€	∞	7	5	2	2	7	9	3		7
Dat	Rmin (neme)	3.7	3.75	None	0*7	77	3.75	3.75	3.9	None	0*7	3.9	0.4	3.7	0.4	0.4	3.9	3.8	3.0	None	0.4
BX	既 (deg)	71	17.5	16) 20	77	6	5	220	77	8	82	8	8	×8	8	8	08X	8	82	83
Data at Rmax	Emax ³ (deg)	16	17.5	77		18	18	18	18	16	19	17	16.5	15	17	17	17	16.5	13.5	12.5	17
Dat	Rmax (n.m.)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	Fired Between Rmax & Rmin	SθΔ	yes	yes		yes	yes	Yes	Yes	V85	ou	on On	yes	yes	yes	yes	yes	yes	Ves	ves	yes
	Code	7-301-D4	10-30R-G5	1-151-AL	9-30I-F5	3-151-03	2-15B-C4	8-30R-F2	5-151-85	6-30R-B3	4-15R-E2	2-15R-C4	5-15L-F5	7-301-D4	9-30L-F5	7-12-13	3-151-03	10-30R-G5	1-15L-AL	6-30R-B3	8-30R-E2
	Run No.	118	118	1183	7187	1185	1186	1.8	1188	8	11%	1191	1192	1193	1197	1195	9611	1197	1198	1199	1200

For definition of code, refer to text. S - The missile is successfully launched. F - An attack failure occurs. I - Run is incomplete. 4.5 Notes:

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TABLE 15
Summary of Fire Control Investigation

Mode	% Success	% Success Relative to Normal Attack Mode
Normal	83.7	100.0
ној	73 : 0	87.2
AOJ	36.5	43.6
Attack While Search (10° Lead Angle)	42.0	50•2
Attack While Search (18° Lead Angle)	40.7	48•6
Attach While Search (25° Lead Angle)	25.5	30•4

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